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PHILOSOPHICAL REMAINS

OF

GEORGE CROOM ROBERTSON

ABERDEEN UNIVERSITY PRESS.

G Croom Robertson

PHILOSOPHICAL REMAINS

OF

GEORGE CROOM ROBERTSON

GROTE PROFESSOR OF PHILOSOPHY OF MIND AND LOGIC
UNIVERSITY COLLEGE, LONDON

WITH A MEMOIR

EDITED BY

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PREFATORY NOTE.

The present volume contains a collection of the more important philosophical writings of the late Prof. Croom Robertson. Outside this work, besides his volume on Hobbes, there remain his historical articles in the *Encyclopædia Britannica* on Abelard and Hobbes, his biographies of the Grotes in the *Dictionary of National Biography* (George Grote, his wife and two brothers—John and Arthur) and other minor contributions to various periodicals.

The memoir is brief and comprehensive rather than minute. It has been somewhat extended by insertions of importance, as will be seen in their places.

The arrangement of the volume, and its superintendence through the press, devolved mainly upon Mr. T. Whittaker. Mr. Whittaker had long been Robertson's assistant in preparing critical and other notices for *Mind*.

The only deviation from full and literal reproduction of the papers is in the case of the first—which is an abridgment, by Mr. Whittaker, of Robertson's inaugural lecture in University College. This lecture is of special interest, as showing how well he had mapped out the ground that he eventually occupied in his philosophical teaching and writing.

The Editors have to acknowledge the courtesy of Messrs. A. & C. Black, in freely according permission to reprint the author's philosophical contributions to the *Encyclopædia Britannica*.

A. B.

Aberdeen, *April*, 1894.

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MEMOIR.

George Croom Robertson was born in Aberdeen on 10th March, 1842. During the earliest years of infancy, he was constitutionally delicate, and, partly on this account, and partly not to stimulate a brain that already gave signs of unusual activity, he did not commence his education till he was six years of age. He was sent first to a dame's school. He mastered the alphabet and learned to read in an astonishingly short time. After a few weeks of this elementary training, he was transferred to the school maintained by the Incorporated Trades, then under the charge of Mr. Roger,—a teacher of some note in his day and a fine specimen of the schoolmaster of the olden type; being as thorough and exact a teacher as he was a strict disciplinarian. The subjects he taught were reading, writing, arithmetic, geography, English composition, and Bible knowledge under the guidance of the Shorter Catechism.

Having spent four years under this regime, Robertson went on, at the age of eleven, to the Grammar School,—where, for the first three years of his course, he was under the tuition of Mr. John Brebner, now Superintendent of Education in the Orange Free State, South Africa. During his fourth year, he was taught by the rector, Mr. Thomas W. Evans. At the Grammar School, the principal topic was Latin, to which were added English (chiefly history) and the elements of Greek. George proved so apt a pupil that, not only did he carry off prizes (some of them firsts) at the several annual examinations, but, at the end of the fourth year, while there was still a year of the usual curriculum to run, he gained by competition the second bursary at Marischal College and University,—which, accordingly, he entered as a student in November, 1857. The first winter was occupied with Greek, under Prof. R. J. Brown, then an elderly man but a not inefficient teacher; Latin, under Robert Maclure, a man of a fair schoolmaster type, with the genius of translation. At the end of the session, Robertson carried off the second prize in Greek, and stood eighth in Latin.

Second year—Higher Classes in Greek and Latin; Mathematics, under Dr. John Cruickshank, a teacher of the first order; and Natural History, under James Nicol, the well-known Geologist. At the end, his prizes were—Greek, first; Latin, fourth; Mathematics, eighth; Natural History, fourth. Third winter—Senior Mathematics; Natural Philosophy, under James Clerk Maxwell, and a voluntary extra class in Greek. At the close, he stood—Mathematics, seventh; Natural Philosophy, twelfth; Greek, first.

At this point, occurred the great revolution in the Aberdeen colleges, by which they lost their individuality and were transformed into one institution—the United University of Aberdeen. As there were duplicate professors in all the Arts subjects, the elder of the pair was superannuated and the work carried on by the younger. The winter session, 1860-61, was the first under the new system, with this qualification, that students who had commenced their courses in the separate colleges were allowed to finish under the regulations previously in force in each. In Robertson's case, all that remained obligatory was to attend the Moral Philosophy Class of Prof Martin, the former Marischal College Professor, now retained in the United University. The new programme of subjects included, for the first time in Aberdeen, a separate chair of Logic, attendance on which was to be compulsory only on students now entering the United University. Nevertheless, the class was actually formed, although attendance could not yet be made obligatory. Robertson attended it voluntarily; and this was the first occasion of my coming into contact with him. He took a high place in the examinations, and at the same time distinguished himself in the class of Prof. Martin. He took the M.A. degree with highest honours, in April, 1861; his leading subjects being Classics and Philosophy.

In October of the same year, there were instituted the Ferguson Scholarships, of the value of £100 a year for two years, open to graduates of all the four Scotch Universities. One of the two was for Classics and Mental Philosophy combined. Robertson competed for this and was successful. My more particular intimacy with him commenced in the months of his preparation for the competition. The examiner in Philosophy was Dr. McCosh, then Professor in Belfast. It was a condition of the scholarship that the successful candidate should for two years pursue a course of study under the direction of the Trust;

and Prof. McCosh was appointed to give the requisite directions in this instance. Robertson at once availed himself of the fund at his disposal to pursue his studies on a very wide scale. The winter of 1861-2 was spent by him in London, where he attended selected classes in University College; one being Prof. Masson's senior class of English Literature, in which he gained the second prize. He also attended Malden's Senior Greek, and the Chemistry class of Prof. Williamson.

In July, 1862, he proceeded to Germany. His first resort was Heidelberg, where he stayed eight weeks; his principal occupation being mastering German. It was to Berlin that he looked for the fullest scope to his curiosity in the wide domain of philosophical and other learning. He reached the German capital on the 24th of September, and remained till the latter end of March—a period of five months, which included the winter *semestre* at the University. He attended two classes of Trendelenburg—one in Psychology, four hours a week; one on the Metaphysics of Aristotle, two hours a week; Du Bois Reymond, Physiology, five hours a week; Althaus on Hegel, one hour a week; Bona Meyer on Kant, two hours a week. He paid frequent visits to Dorner, and afterwards kept up a friendly correspondence with him and with Trendelenburg. He also saw Lepsius at his house, and, on leaving, was presented by him with a copy of his *Royal Dynasties of Egypt*. He maintained, at the same time, a sedulous course of reading, devoting himself more especially to Kant.

Leaving Berlin, he made a tour in Eastern Germany on his way to Göttingen, where he remained two months. He attended Lotze on Metaphysics and Rudolf Wagner on Physiology. With both these he had subsequent correspondence, and obtained from Wagner a letter of introduction to Broca in Paris, whither he now directed his course. He arrived on the 24th of June, and continued there till the 10th of September—a very busy time, but details are wanting. He was recalled to Aberdeen by the intimation of a vacancy in the Examinership in Philosophy, but that he failed to obtain. He now remained at home, devoting himself to philosophical study. It was during the year following his arrival that I obtained his assistance in revising *The Senses and the Intellect* for a second edition. He elaborated a number of valuable notes from his German studies,—such as the addition made to the handling of the muscular sense. Also, for *The Emotions and the Will*, he contributed the classifications of the Feelings prevalent in Germany,—those of Kant, Herbart, and their followers; and in other ways aided in the revision. After bringing out the second edition of those two volumes, I was occupied for some time in preparing a Manual of Rhetoric. For this he compiled the Classification of the SPECIES OF POETRY and VERSIFICATION. He, likewise, co-operated with me in making a search for suggestions and illustrations in Aristotle's *Rhetoric* and Quintilian's *Institutes*. The result, however, was disappointing; extremely little could be discovered in either for adaptation to a modern manual. In September, 1864, he was appointed teaching assistant to Prof. Geddes, and shared with him the work of his Greek classes. He performed the same duty for session 1865-66. The remuneration was £100 a year, and no duty was required during the seven months' vacation. He was able, therefore, to devote himself largely to philosophical work. In 1864, he wrote an article on German Philosophy for the *British and Foreign Evangelical Review*, which appeared in the July number. He also wrote an article on Kant and Swedenborg in *Macmillan*, for May, the same year.

In the summer of 1866, a vacancy occurred in the Chair of Mental Philosophy and Logic in University College, London. After an abortive attempt on the Chair of Philosophy in Owen's College, Manchester, Robertson became a candidate for this vacancy. His chief rival was Dr. James Martineau, whose cause was espoused with great energy by one section of the Council, while another section, under Grote's leadership, favoured Robertson. The leading incidents of the struggle are given with official exactness by himself in his life of Grote in the *Dictionary of National Biography*. The election took place in December, and he opened his class in January, 1867.

His residence henceforth was London.

Before he left Aberdeen, I obtained still further assistance from him towards the Manual of Ethics, forming part of *Mental and Moral Science*. His contributions were—The Neo-Platonists, The Scholastic Ethics, Hobbes, Cumberland, Cudworth, Kant, Cousin, and Jouffroy. He had no further hand in the Manual except in revising some portions of the proofs.

Not long after being appointed to University College, he conceived the project of a work on Hobbes; for which Grote gave him every encouragement, and wrote to the Duke of Devonshire to procure for him access to the MSS. preserved in the family seats. As usually happens, this design proved more laborious and protracted than was at first imagined. In addition to the labour that might naturally be counted upon, an unexpected difficulty was encountered in connexion with Hobbes's mathematical writings. It seems that in Molesworth's edition these were very carelessly edited. In order to do justice to the hot and lengthened controversy between Hobbes and Wallis, he had, at considerable pains, to resuscitate his mathematical knowledge and to trace out the sophistical reasonings of Hobbes through all the disguises that his ingenuity enabled him to put on.

One portion of his researches on the biographical part appeared in the *Encyclopædia Britannica*, and the completing section of the biography, together with a survey of the writings, came out in the volume in Blackwood's Philosophical Classics. Although this work was not executed on the scale originally projected, it preserved the most important part of his labours, and is duly appreciated by students of philosophy. His enlarged purpose would have included more copious reference to the great contemporaries and precursors of Hobbes, whom he had studied with no less care, and to whom he might have done justice in other forms had he been longer spared.

For his elementary lectures at the College he prepared, with all due painstaking, courses of Logic, deductive and inductive, systematic Psychology, and Ethical Theory. All through his career his attention was nearly equally divided between the elaboration of philosophical doctrines according to their most advanced treatment, and the history of philosophy both ancient and modern. The summer courses at University College, which were adapted to the requirements of the M.A. degree at the University of London, generally took him into fresh ground—the ancients and the moderns alternately—and were the occasion of a special study of the original authorities. His accumulated stores of historical material were thus very great, as his publications from time to time made manifest. A few more years of active vigour would have enabled him to leave a monument of the history of philosophy second to none. His doctrinal clearness was a notable and pervading characteristic of all his expositions of foregone thinkers.

He delivered some carefully prepared popular lectures at Manchester, Newcastle, and the Royal Institution, London. One subject was "The Senses"; another "Kant," on whom he gave a course of four lectures at the Royal Institution in 1874. His introductory lecture at the College for October, 1868, appeared in the *Fortnightly Review*. Other topics of popular lecturing were "The English Mind," "The History of Philosophy, as preparation for Descartes," and "Locke". He gave for several years the philosophical course to the College of Preceptors.

From 1868 to 1873, and again from 1883 to 1888, he was Examiner in Philosophy in the University of London. His examination papers are sufficient proof of his efforts to do justice both to the subjects and to the fair expectations of candidates. He also acted as Examiner in the University of Aberdeen from 1869 to 1872, and from 1878 to 1881. He examined for the Moral Science Tripos, Cambridge, in 1877-78, and for the Victoria University, Manchester, as one of the original staff.

He was engaged by Dr. Findlater, editor of *Chambers's Encyclopædia*, to furnish contributions to that work. When the Messrs. Black projected their new edition of the *Encyclopædia Britannica*, they invited Findlater to become their editor. He declined the task, and suggested a choice between Thomas Spencer Baynes and Robertson. When Baynes entered on the work, he engaged Robertson as a contributor in Philosophy. The articles actually written by him were Abelard, Analogy, Analysis, Analytic Judgments, Autonomy, Association, Axiom, Hobbes. Baynes had also bespoken from him the article Psychology; which he undertook, intending it to be on historical lines. When the time came near, he found himself unequal to the effort and recommended James Ward in his stead,—a fortunate arrangement as it turned out.

On the death of Grote in 1871, he had the principal share in editing the Posthumous Work on *Aristotle*, which occupied him the autumn and winter of that year. From the distinctness of the MS., this was, in one respect, not a difficult task, although involving a considerable expenditure of time in revision. What chiefly made it toilsome and anxious was a want of exactness on Grote's part, through some defect of vision, in entering the numerical references to the text. Every one of these had to be carefully verified from the originals. The result was a masterpiece of correct editing; and the work as thus brought out will deserve to be ranked as an *editio princeps* of Grote's monograph on the Stagirite.

The death of Grote brought out the fact that he had left to University College a sum of £6000 as an endowment to the Philosophy Chair. Mrs. Grote, who was entitled to the life interest, surrendered the amount in 1875, two years before her death.

In the year of the publication of *Aristotle*, 1872, Robertson married Caroline Anna Crompton, daughter of Justice Crompton. She was in every sense a helpmeet; having the same views on the higher questions of life, and being an earnest labourer in the public questions that he also had at heart. She was likewise of service in his official work, when his strength became barely equal to its routine.

Robertson was a member of the Metaphysical Society of London, which flourished for several years and drew together a remarkable mixed assemblage of philosophers, politicians, and ecclesiastics. He contributed a paper on the 13th of May, 1873, on "The Action of so-called Motives". This paper was reprinted in *Mind*, vol. vii. p. 567, and is one of our best handlings of the Free Will question on the basis of a critical examination of the verbal improprieties that obscure the issue.

In 1880, when I resigned the Logic Chair in Aberdeen, he was by general concurrence my destined successor. So much was this felt by aspirants to the office, that, until he declared his resolution on the subject, no other candidate entered the lists. Only after he made up his mind to remain in London was there an open competition.

In 1874, I broached to him the founding of a Quarterly Journal of Philosophy; explaining my notions as to its drift, and asking his opinion of the project. My desire was that he should be editor in the fullest sense of the word; and, on that condition, I undertook the publishing risks. After full consideration he approved of the design, and accepted the editorship on the terms proposed to him. The subsequent steps necessarily were to obtain the concurrence and approbation of active workers in the field. I first approached Mr. Herbert Spencer, and found him cordial in favour of the scheme. I next saw Messrs. Venn and Sidgwick in Cambridge, and obtained their full concurrence and promise of support. Other parties were seen by Robertson, or corresponded with, both in England and in Scotland. The amount of encouragement was such as to decide us in organising the work for speedy publication. We at first thought that it might be brought out in the course of the following year, 1875; but as it could not be ready in the beginning of the year, it was finally arranged that the first number should appear in January, 1876. Robertson bore the brunt of the requisite preparations for the start; settling the plan and arrangement of the numbers, procuring the requisite pledges of articles in advance, and drafting the programme. It was his happy inspiration that gave the title, which commended itself at once to every one.

Our earliest success was the series of papers on Philosophy in the Universities. We had the good fortune to lead off with Mark Pattison on Oxford, and to secure admirable representatives for the others in succession; Robertson himself supplying the account of the University of London. Another matter that we had set our hearts upon we did not succeed in,—*viz.*, to set going a series of discussions on the conduct of Examinations in Philosophy. Perhaps, either of ourselves ought to have broken ground: but, as we did not do so, many other contributors naturally have felt shy at an operation involving criticism of one another's published examination papers. Nevertheless, the subject is one pre-eminently suited for a free interchange of views. The enormous number of questions set every year in the department of philosophy, in connexion with the conferring of degrees and otherwise, by exhausting leading questions tempts examiners to select out-of-the-way and recondite points which do no justice to the candidate's natural course of study: an evil that ample discussion might be able to remedy.

It was of course a prime object of the Journal to keep the English reader *au courant* with foreign publications in the philosophical field—both set treatises and periodicals. In this last region, most important aid was given at the outset by Prof. Flint, of St. Andrews,—which he was obliged to discontinue on being appointed to the Theology Chair in Edinburgh.

The editor spared no pains to procure contributions of a like nature, and took upon himself a large part of the burden of supplying the desideratum. Indeed, in every department of the work of the Journal, it is unnecessary to say that he had always the lion's share. Now that he is gone, it is a satisfaction to think that, besides contributing largely to the review of novelties from every corner, and expounding the great historical names of the past, he communicated his most advanced reflexions upon many leading questions in psychology, philosophy, and logic. It is perhaps unnecessary for me to say more, considering that the result is accessible, and that the collective body of contributors have recently given expression to their estimate of his merits. It would, however, be an omission on my part, not to express the deliberate opinion formed on sixteen years' experience, that I regarded him as, in every point of view, a *model editor*.

Twelve years before his death, his fatal malady began to show itself. On discovering the serious nature of the attack—calculus in the kidney,—he set himself to work to parry its advances by every form of precaution and self-denial that his skilled advisers and his own experience could suggest; being aided by the unremitting devotion of his wife. How such a malady could have got possession of him at the age of thirty-eight, it is needless to speculate. This much we can pronounce, after the event, that the strain of his intellectual application from early years was excessive. His persistent labours were aggravated by a fervour of manner which, though raising his value as a public teacher, involved a nervous expenditure that even a naturally healthy system could not well afford.

During sessions 1883-4, 1886-7, and part of 1887-8, he had to employ substitutes for his teaching work. He had given in his resignation in April, 1888; but the Council declined to accept it, until he should have the relief of another session by means of substitute. He finally resigned on the 7th May, 1892.

He threw himself with the utmost zeal into the business management of the College, first as a member of Senate, and latterly as one of the Senate's representatives on the Council. Not long after his appointment, Grote learned with great satisfaction that he was highly esteemed among his colleagues in the Senate for his judgment and energy in business matters. In the larger sphere of the Council's operations, he promised to make himself extremely serviceable, when his failure in health obliged him to withdraw from being a member.

His colleague, Prof. Carey Foster, has furnished an estimate of his character and active co-operation in the business of the College, first in the Senate, and latterly in the Council. I give it in his own words:—

"For some time after his appointment as Professor, he was not a frequent attendant at meetings, being presumably occupied with the work of his Chair, and leaving general questions to the management of his older colleagues.

"His great value was very much in the part he took in *discussion*. Here he was always ready, clear, and to the point. Of course, in connexion with the business of such an institution as University College, it will often happen that proposals are made which, for some reason or other, are distinctly undesirable, but which it is not easy to meet in an effective way on the spur of the moment, at least not without taking an attitude of personal opposition to the proposer. In such cases, I have often been very much struck with Robertson's quickness in seizing the proper ground of *principle* to be adopted in considering the course proposed. Generally, almost always, I am happy to say, he and I were closely agreed in our views; but, while I might be casting about to find the right way of meeting a proposal I disapproved of, the opportunity for useful opposition would often be gone. Robertson, on the other hand, would cut in at once with exactly the right consideration of general policy to which all were ready to agree.

"He was Dean of the Faculty of Arts and Laws for the Session 1871-2, and of the Faculty of Science for the Session 1880-1, and 1881-2. This is an office which involves a very considerable amount of attention to current working details, and Robertson discharged it on both occasions with great efficiency and assiduity, but I do not find any special records of importance.

"In 1883 a matter occurred which, at the time, created a good deal of feeling, both in the College and in some circles outside. This was the refusal of the Council to admit Mrs. Annie Besant and Miss Alice Bradlaugh to the Class of Practical Botany. I think there is no doubt that the Council acted within their legal power in this case, but many of us, Robertson very decidedly, disapproved of their action, and felt that it was not only inexpedient but opposed to the spirit of our traditions.

"In 1886, for the first time, Professors were admitted (first at three, afterwards, in 1888, six) to serve on the Council of the College. Robertson was selected by his colleagues on the Senate as one of their first three representatives. He held office for four years, and, while health lasted, was very assiduous in his attention to the business of the Council. In particular, he took an active part in the discussions that arose on the drafting of the Charter of the proposed Albert (afterwards Gresham) University. He was a member of the Special Committee charged with the matter, and strove energetically to give to the scheme at once a more liberal and more academic character than it eventually assumed. If his health had allowed him to make still greater exertions, perhaps this scheme would have had a different issue."

By help of extracts from the minutes of the Senate where Robertson's name appears, some further particulars may be gleaned as to his lines of activity. In particular, with reference to the admission of women into the classes in which University College took the lead, he bore a prominent part. In the various steps by which the final result of mixed classes in every department was arrived at, he was a chief spokesman and adviser. It was on 23rd April, 1869, that he moved appointment of a committee "to consider the expediency of admission of women to classes in University College". A report presented 4th May recommended that classes for ladies in physics and chemistry, in connexion with the Ladies' Educational Association, be held in the College next session. This meant that the Professors should repeat their courses to women exclusively; a necessarily burdensome imposition upon the teaching strength of the College. The Professor of Political Economy, Cairnes, having represented himself as unequal to a duplicate course, was allowed to teach a class of men and women mixed. The mixing gradually extended to other classes; the years 1877 and 1878 saw the final admission of women into the classes generally, Robertson being on the Committees that promoted the achievement. In his own class, female students were latterly in the majority.

He repeatedly sat on Committees of Senate for recommending appointments to vacant chairs; as, for example, Mathematics (De Morgan resigned, Hirst appointed), Applied Mathematics and Mechanics (Clifford appointed), Political Economy (Cairnes resigned, Courtney appointed), Greek (Malden resigned, Wayte appointed).

Acting under the lead of John Stuart Mill, he entered zealously into the movement in behalf of women, and was from December, 1870, to December, 1876, a member of the Committee of the London National Society for Women's Suffrage. A brief account of the movement will serve to show Robertson's connexion with it, more particularly as the recipient of letters from Mill.

In the spring of 1871, serious differences of opinion among the workers for the movement becoming evident, proposals were made for the formation in London of a new Committee—which, when fully organised, assumed the title of 'Central Committee of the National Society for Women's Suffrage,' and desired to affiliate to itself all existing Societies for Women's Suffrage. From the first, the chief ground of antagonism between the two Committees (the London National and the Central) was diversity of opinion concerning the agitation against the C.D. Acts. Those engaged in the agitation at no time proposed to use, for their purpose, funds subscribed for the promotion of Women's Suffrage; but many of them did seek and claim perfect freedom to assert, at Women's Suffrage meetings, that the repeal of the C.D. Acts was one of the objects for which the suffrage was desired. And they saw no reason why the same persons should not be prominent in both agitations.

Although Mill, in common with Robertson, disapproved of the C.D. Acts, and, on one occasion, denounced them at a Women's Suffrage meeting, he became fully convinced that the association of the two questions would have a most injurious effect on the prospects of the Women's Suffrage movement. With his cordial approval, the Committee of the London National Society declined to connect itself with the new Central Committee, and Mill shortly afterwards gave his name as Hon. President.

Robertson took a prominent part in the discussions which led to this result, was in constant correspondence with Mill on the subject, and, until Mill's death in May, 1873, continued to be the medium of communication between the Committee and its President. After Mill's death, he was less actively engaged in the work of the Committee, though he still frequently attended its meetings.

When, in the winter of 1876, Mr. Forsyth, who had been the parliamentary leader of the movement, since the general election in February, 1874, was succeeded by Mr. Jacob Bright, Robertson, along with several of his associates, retired from the Committee. Thenceforward, while his opinions, I understand, remained unchanged, he took no part in the Women's Suffrage movement.

A notice of Robertson that appeared in the *Spectator*, 1st October, 1892, by his most intimate friend Mr. Leslie Stephen, is the best conclusion to the sketch of his life, and saves me from much that would be necessary to do justice to him. In point of exactness of appreciation and felicity of statement, it would be vain in any one to rival the delineation thus afforded.

"I hope that you will permit me to say a few words about the late Professor Croom Robertson. I had the great happiness of an intimate acquaintance with him during the later years of his life, and can mention some facts which ought, I think, to be known to all who may have been interested in his work. Every serious student of philosophy is aware that Prof. Robertson was an accomplished metaphysician and psychologist. I do not suppose that there are more than two or three living Englishmen whose knowledge of those subjects is comparable to his for range and accuracy. He had given up his whole life and energy to such studies from very early years, and whatever he did, he did thoroughly. My own knowledge only enabled me to appreciate his acquirements within a comparatively small circle; but whenever I applied to him for advice and information, I was surprised afresh by the fulness of his knowledge. He had always considered for himself any question that I proposed to him, and knew what was to be found about it in previous literature. My own experience was confirmed by those who were better judges than I could be. It was impossible to consult him without being struck by his command both of the history of past speculation and of the latest utterances of modern thinkers. His judgments, whether one accepted them or not, were at least those of a powerful, candid, patient, and richly stored intellect. He has not, indeed, left much behind him to justify an estimate which will, I think, be accepted by all who knew him. His excellent monograph upon Hobbes, and a few articles, chiefly critical, in *Mind*, are, I fear, all that remains to give any hints of his capacity. For this want of productiveness there were, unfortunately, amply sufficient reasons. Robertson was, in the first place, conscientious almost to excess as a worker. He could not bear to leave undone anything which was necessary to secure the utmost possible precision. He would not write till he had considered the matter in hand from every possible point of view, and read everything at all relevant to his purpose. As editor of *Mind* he expended an amount of thought and labour upon the revision of articles which surprised any one accustomed to more rough-and-ready methods of editing. Besides correcting misprints or inaccuracies of language, he would consider the writer's argument carefully, point out weak places, and discuss desirable emendations as patiently as the most industrious tutor correcting the exercises of a promising pupil. Contributors were sometimes surprised to find that their work was thought deserving of such elaborate examination; and it often seemed to me that he could have written a new article with less trouble than it took him to put into satisfactory shape one already written, with which, after all, he perhaps did not agree. He never reviewed a book without thoroughly making himself master of its contents. He applied, as I have reason to believe, the same amount of conscientious labour to the discharge of his duties as Professor. His work in the two capacities absorbed, therefore, a great proportion of his disposable energy. So conscientious a worker was naturally slow in original production. He would not slur over any difficulty in haste to reach a conclusion. Robertson, indeed, like most of us, had some very definite opinions upon disputed questions, and belonged decidedly to what is roughly called the empirical school. But, whatever his views, he was always anxious to know and to consider fairly anything that could be said against them. Had he ever been able to give a full exposition of his philosophical doctrines, the last accusation that could ever have been brought against him would have been that of hasty dogmatism. He might have failed to appreciate the opposite view; but the failure would not have been due to any want of desire to understand it thoroughly. He was always anxious that *Mind* should contain a full expression of all shades of opinion. Whether he succeeded in this is another question. An editor can open his doors, but he cannot compel every one to enter. I can only say, from my own knowledge, that he did his best to secure the co-operation of the men from whose views he most decidedly dissented.

"There was, however, a cause for want of productiveness more melancholy and more sufficient than those of which I have spoken. When I first knew Robertson, he told me that he was preparing a book upon Hobbes. It would have included an estimate of the whole philosophical movement of the seventeenth century. He had gone into all the preparatory studies with his usual thoroughness. He had examined the papers preserved at Chatsworth; and had at his fingers' ends all the details of the curious and obscure controversies in which Hobbes was engaged with the mathematicians as well as with the philosophers of his time. When I wrote for the *Dictionary of National Biography* a life of Hobbes, which was in substance merely a condensation of Robertson's monograph, supervised by Robertson himself, I was astonished by his close acquaintance with all the minutiæ of the literary and personal history of the old philosopher. Unfortunately that monograph was itself only the condensation of knowledge acquired with a view to his larger work. He was obliged to abandon the original scheme by the first appearance of a cruel disease from which he was ever afterwards a sufferer. He had to submit to painful operations, which severely tried his strength. Though temporary relief might be obtained, he lived under the constant fear of renewed attacks, and was forced to observe the strictest regulations for the sake of his health. It was not surprising that his labours took up all his strength; but, on the contrary, surprising that he had strength enough to do what he did. Seldom free from actual pain, or, at least, discomfort, and never free from harrowing anxiety as to future suffering, he struggled on, doing his duty with the old conscientious thoroughness. He was forced more than once to seek the help of colleagues and friends, always, I need not say, cheerfully given; but he did all that man could do with a really heroic patience. I have sat with him when he was still in bed from the effects of a painful operation, and in his periods of comparative ease. He was always the same,—cheerful, often even in high spirits; delighting in talk of all kinds; keenly interested in all political and social questions, as well as in his more special studies, and yet by no means averse to mere harmless gossip; while always manifesting a most affectionate zeal on behalf of his personal friends, and of his own and his wife's relations. A man so tormented might have been pardoned for occasional irritability. I will not say that Robertson never showed such a weakness, but I can say conscientiously that I have never known a man in perfect health and comfort who showed it less. On the very rare occasions in which a little friction occurred between him and some of his acquaintances, I was especially struck by his extreme anxiety to say and do nothing which was not absolutely necessary in self-defence, and to guard against being hurried into unfairness by any loss of temper or personal sensibility. I shall never know a juster or fairer-minded man. I always looked forward with pleasure to an interview with him, sure to return on better terms with men and things, with quickened interest in important questions, and with the refreshing sense that I had been in contact with a man of vigorous understanding, and utterly incapable of any mean or unworthy prejudice.

"During Robertson's severe trials, his wife's society had been an inestimable support. Of her, I will only say that she was a worthy companion in a heroic life, that she soothed his sorrows, shared all his interests, and did all that could be done to secure his happiness. Recent losses in her family and his own had inflicted wounds, taken with the usual courage. In the early part of this year, a heavier blow was to come. Mrs. Robertson was pronounced to be suffering from a fatal disease, of which there had, indeed, for some time previously been ominous symptoms. She died on 29th May last, patient and courageous to the end, having in her last illness made every possible arrangement for her husband's future life. Robertson bore the heaviest sorrow that can befall a man in a spirit of quiet heroism, of which, to speak fittingly, one should use the language rather of reverence than of admiration. He had resigned his editorship and his professorship, steps which his wife had seen to be necessary. He did not, however, abandon his intellectual aspirations. He spent the summer with his relations, and had sufficient power of reaction to be planning employment for his remaining life. I heard from him not long ago that he intended, upon returning to London, to get to work upon Leibnitz, in whose philosophy he had long taken a special interest. But his constitution was more shattered than he knew. There was to be no more work for him. A slight chill brought on an illness which was too much for his remnant of strength. He died peacefully and painlessly on 20th September, within four months of his wife.

"Robertson's friends know what he has been to them. They cannot hope fully to communicate the knowledge to others. But it seems to me hardly fitting that such a man should be taken from us without some attempt to put on record their sense of the noble qualities which are lost to the world. Whatever the limits imposed upon him by the circumstances I have mentioned, few men, if any, have done so much in their generation to promote a serious study of Philosophy in England. But those who knew him feel more strongly now the loss of a dear friend. No more true-hearted, affectionate, and modest nature has ever revealed itself to me; and if anything could raise my estimate of the quiet heroism with which he met overpowering troubles, it would be his apparently utter unconsciousness that he was displaying any unusual qualities in his protracted struggle against the most trying afflictions."

PSYCHOLOGY IN PHILOSOPHIC TEACHING.[1]

THE special question I have chosen for discussion is: What is the meaning to be attached to the phrase, Philosophy of Mind? In the wider sense of the phrase, all philosophy may be called philosophy of mind; but unless we can somehow limit its meaning, unless there is some part of the whole that is at once central and fundamental, and at the same time suitable for teaching, we are in a bad case. The English teacher of philosophy has not, like the German, a subject divided into well-defined departments, all understood to be subordinate to philosophy in general. He cannot range from one to the other without misleading students as to their relation to the whole, but must be severely practical in his choice of subjects. Let us see then if we cannot find some distinct department of inquiry, on the face of it answering to the name of Philosophy of the Mind, and yet so evidently at once fundamental and teachable, that it has claims on our attention beyond any other department apparently fundamental but not teachable, or really teachable without being fundamental.

The importance of Ethics is allowed; teachable it is beyond question; but in the Philosophy of the Mind it is not fundamental. Æsthetics is a subject which, though it has been less elaborated than Ethics, stands on the same level; standing only on the same level, it does not fulfil our conditions. Logic, if we were to accept the opinion of some who make it co-ordinate with Ethics and Æsthetics—the three sciences answering in like manner to the three great departments of Mind, *viz.*, Intellect, Will and Feeling—is as little fundamental as they. These sciences are all teachable; but they are not what we are in search of. They are essentially special developments and applications of something else that is fundamental.

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[1] Abstract of Introductory Lecture on appointment as Professor of Philosophy of Mind and Logic in University College, London (1866). This Lecture—which is of considerable length—is given in abstract as containing a very clear statement, dating from so early a period, of the position with regard to the peculiar importance of Psychology that Prof. Robertson always consistently maintained.

Is Metaphysic this something? Of Metaphysic, there is no definition more serviceable than Aristotle's. Under the name of First Philosophy, Aristotle defines it as the science of the general principles common to all forms of Existence, or, which is the same thing, to the subject-matter of the different special sciences. If such a science existed in an indubitable shape, it could indeed claim to be in a certain sense fundamental and of altogether pre-eminent importance. But does a definite Science of Metaphysic exist? It is true that nearly every great philosopher since Aristotle has had *his* Metaphysic—observe the expression; but not one has succeeded in establishing fixed principles universally allowed. Though they have not passed away leaving no trace and accomplishing nothing, yet all the metaphysical systems, as such, have alike come to an end. This is illustrated especially by the history of the ambitious post-Kantian systems in Germany.

It is clear that if Metaphysic is ever really to exist in a settled form, it will not come by the way of merely speculative construction, as a simple evolution of thought, but in a far less direct and far more laborious way. Without prejudging the future, then, we may find better employment than trying to persuade ourselves that Metaphysic exists already. Not that the establishment of anything that can be called a Metaphysic must wait upon the completion of the special sciences. At every stage, we must order our knowledge somehow—must encircle it with metaphysical conceptions of some sort. But is a time of widening and deepening special knowledge, both of the world without and of that which concerns us more, the world within, the best time for making metaphysical considerations prominent?

Ought we not now to impress above all the necessity of extending knowledge, and refuse to sacrifice everything to a subject neither easily communicable to beginners nor affording a true starting-point for discovery?

The real and natural beginning is a rigorous investigation of the *phenomena* of mind. If all Philosophy must be essentially Philosophy of the Mind, because it views nothing except in express relation to Thought, the question as to the innermost nature of mental action must surely be taken first. It is Psychology that attempts to answer this question; and Psychology, which is equivalent to Philosophy of the Mind in a narrow sense, will thus be the most fundamental and representative part of Philosophy, or Philosophy of the Mind, taken at the widest. That this is not a statement made for mere convenience will appear if we turn to history. We shall then find that almost every important philosophical revival after a time of speculative quiescence, and every important philosophical reformation after a time of too highly strained metaphysical dogmatism or unsatisfying scepticism, has been begun by some man who saw the necessity of looking deeper into the mental constitution. The point of view of all modern philosophy from Descartes onward is psychological. It is not English philosophy that has remained least true to this conception. And we may find in Germany ardent converts to the cause of scientific psychology as the true point of departure in philosophy. If, as seems now at last likely, the German current of philosophical inquiry and the English are about to meet and flow on henceforth in a single channel, it is hardly to the disadvantage of the English that it has not been spreading itself in futile wanderings, and in vain efforts to water boundless wastes.

Psychology then is, and must still be for a long time to come, the only true point of departure in philosophy for us and for all; and if it has not been expressly pointed out that it satisfies our other requirement of being eminently teachable, this is because that seemed a work of supererogation.

How is Philosophy of the Mind, in its limited sense of Psychology, to be treated? The extremest form which difference of treatment can assume seems to be found between those who trust to individual introspection only, and take its immediate data as they find them, and those who confine themselves to no single line of observation, but, proclaiming the necessity of analysing back to the beginnings and elementary conditions of conscious life, think every way good that helps at all to take them there. The Faculty-hypothesis is the proper expression of the first position. It would be unjust, indeed, not to point out that mental introspection, without other aids, has sufficed to lead some, who knew how to use it, to far deeper views; but, if still further insight is to be gained, we must go not only beyond the traditional doctrine, but beyond the traditional method. If mental science requires only simple observation of the internal kind, what was to hinder observers like Aristotle—a better simple observer modern times do not show—from bringing Psychology to completion?

That physiology in particular, among the objective aids to introspection, gives real psychological insight, may be shown by definite cases. For example, we see the vertical line of a cross longer than the horizontal line when the two lines are really of equal length. The illusion is explicable by the greater exertion required to move the muscles of vertical than of horizontal motion; and this explanation is not attainable by mere introspection. A more difficult case, where physiology has also proved applicable, is the question of unconscious mental modifications. Again, the distinction between active and passive sensation has already revolutionised the question of perception. This distinction was not particularly noted until the time when the modern science of physiology was being founded; and even if we grant (what is probably not true) that the antithesis could ever have been fully apprehended by the subjective consciousness alone, we are much aided in conceiving it by physiology.

To take account of the objective states that run parallel with subjective states is not speculative materialism. Nor does all the difference between the common and the advanced psychology consist in talking about nerves and muscles. If there were time, it could be shown that important aid is to be got from many other sources; from comparative psychology, statistics, history, &c. Even then the true difference would not have been given, for it is a difference of general spirit, which shows itself not so much in resorting to any particular species of inquiry, as in a readiness to resort to every kind that can be turned to account.

PHILOSOPHY AS A SUBJECT OF STUDY.[1]

It having fallen to me on this occasion to offer the few words of general welcome at the beginning of our academic session, I have chosen to speak upon a subject—the Study of Philosophy—which may seem to require some apology. As our plan of education is constituted, and not only here in London, there is no subject included in the round of general liberal study that lies more in the outer confines or is taken up later than philosophy. Very few of you can as yet have begun the study; of the more advanced there may even be a number who, in pursuance of some more special aims, have determined never to begin; and those who now appear here for the first time can hardly be expected to feel much concern in a branch of study which they will approach only some years later, if ever they come near it at all. Why, then, for such an audience, select such a subject of discourse? For several reasons. In the first place, the subject being the one in which the speaker is specially interested, he may, to that extent, be likely to speak to greater purpose. If this in general might not be a very safe reason to advance, it may pass here along with a second—that philosophy, however we may put away the teaching of it, is a curious subject, as appealing somehow to all thinking beings, and claiming to say its word about all things; while, as commanding interest, it happens to have a curious history, both for itself, and in the particular relation, as a subject of study, in which we are now to consider it. In the third place, if in this particular relation there should turn out occasion for saying something against prevailing views or practice, and in favour of different views and a different practice, one could not desire fitter audience than just such an assemblage of young men, all embarked on a course of academic study; which means that you are open-minded votaries of science, and none of you either too old and stiffened in your ideas, or too young and unconcerned, to be impressed, and perhaps converted, by suggestions put forth in the interest of pure knowledge. These are some reasons, and it would be easy to add others. But I think I may assume that you are all willing enough, in the meantime and until we see, to sink the objection that philosophy lies far away about the end of our college prospectus, out of the path of commoner interest. The fault will then be mine, if at the close the objection is left as one that can still be urged.

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[1] The Introductory Lecture at University College, London, October, 1868.—Reprinted, by permission, from the *Fortnightly Review*, December, 1868.

It would seem most natural to begin by explaining exactly the meaning of philosophy: but I make nothing of leaving that to come out in the course of the remarks. It is not only the foes of philosophy that will be found talking about the difficulty of its definition. Its advocates may very well know that they are fighting for something, and what they are fighting for, although they cannot make themselves comprehended so easily by all, or so precisely by any, as the botanist or the mineralogist. As already hinted, there is simply nothing real or thinkable, and no possible relation among things, that does not somehow come within the philosopher's province; and this is what no special inquirer can say of his science. We cannot wonder, then, at peculiar difficulties of expression. When it comes to be a question of making charges or suggestions, I am bound to be explicit. Meanwhile, it may be enough to call philosophy the reasoned search for ultimate and most general comprehension of the universe of things, with conscious regard to the fact of their being thought.

Now if history attests anything, it proclaims a search of this kind to be one of the most irrepressible impulses of human nature, as soon as the race anywhere attains a moderate degree of security of existence. It is not, however, this general truth that I want to begin by impressing, but a more special fact,—that philosophy has from of old entered very largely into the educational scheme of the chief historical peoples, and in this shape has been a great factor in human history.

Of necessity we look first to Greece, because it is to the Greek settlers on the coast of Asia Minor, who, about 600 years before Christ, began to reason out some general expression for the multiplicity of human experience, that we trace back the whole movement of thought, at least in the Western world. Once begun, how eagerly the movement was sustained by different sections of the Hellenic race is a remarkable story, even before we can clearly note at Athens, less than two centuries later, its first large educational result. About the Sophists we all have heard, and about Socrates, whom some call the greatest of them, and others the founder of a truer teaching upon the overthrow of theirs. For our present purpose it is enough that in the foremost human culture of that time questions of philosophy—reasonings about the general frame of things and all the highest concerns of humanity—made so great a part, that the youth of the small city then at the head of the race could support a large band of philosophical instructors, and helped to excite to a life of strange questioning and critical activity one man with whom the human mind awoke to a new apprehension of the meaning of science or true knowledge. And this was but the first result. For, from that time, as the history of Greek literature was mainly the history of Greek philosophy, of efforts unceasingly carried on, amid political revolutions and national decay, to compass the nature and reason of things, to discover the rational rule of life, and unlock the secret of human destiny, so all highest instruction was had in philosophic schools. Nor must we think thus only of Greeks. The ancient pagan world, enduring some four or five centuries into the Christian era, never knew the national rivalry in science and philosophy so familiar to us; and though Roman dominion might cover all, and Latins contest the palm with Greeks in poetry, oratory, and history, the philosophical thought about man and the universe was always in substance Hellenic. To the last the ancients had but two great centres of science and learning, or, as we should say, universities; and they were the Hellenic cities of Athens and Alexandria. When we see, then, at Athens, the chair of Plato filled by an unbroken line of teachers for some 800 years, and observe the struggle between Paganism and Christianity protracted at Alexandria by the desperate efforts of Neo-Platonist professors to retain hold of the minds of youth, with a doctrine combining the mysticism of Plato and the width and demonstrative force of Aristotle, we could not have more striking evidence of the place and power of philosophy in the ancient instruction.

Upon the triumph of the Church, coinciding with the great inroads of the barbarians, the centuries of darkness and confusion followed, and when the light of philosophy and science went up in the world again, it was first in the Arab dominion stretching from Bagdad to Cordova. But in Christendom, also, no sooner were monastic schools planted during Charlemagne's brief triumph over European disorder, than philosophy resumed her ancient place at the head of instruction. Alcuin was sent for from these islands, where the darkness had never been so complete, to direct the new intellectual movement; and in the next century, the ninth, another philosopher, John Scotus Erigena, Irish or Scotch by birth, struck at Paris the first note of that famous system of Scholasticism which, after another century or more of blank confusion, engaged all the intellect of Europe until the fifteenth, and struggled for mastery over the human mind far into the modern period. By nature the very opposite of an unfettered and disinterested intellectual search for truth, scholasticism, or Church-philosophy, did yet include an element of independent thinking for which it has seldom got credit; and incorporating itself in a remarkable organisation of instruction and free interchange of thought, it was for a long time in a very real sense a philosophical liberal education. And, for one thing, it is by no means clear that in so greatly extending the scholastic horizon of thought and knowledge, we have been as careful as the schoolmen were about the discipline that gives the power of sweeping it.

The sixteenth century ushered in a new era. It was not, as some say, that positive science then of a sudden sprang into life; for, although the chief scientific discoveries began to date from about that time, the mistake is as great to suppose that men did not scientifically observe, experiment, and reason before, as that they never have used wrong methods or landed in unscientific conclusions since. Nor was it because, owing to a hundred social and political causes, the revival of letters took place, enriching Europe with the treasures of ancient literature, and overpowering the scholastic mind with a first true notion of what the Greeks had achieved in philosophy. It was rather that men had outgrown—very slowly, but still outgrown—the scholastic conceptions, and could no longer be held by so narrow an idea of the universal order, nor satisfied with such a notion of the human lot. So, except for the natural revulsion in a number of minds against everything—even to the name of philosophy—associable with the cast-off system, it was an ardent desire for a new settlement of all highest questions rather than any disposition to ignore them, that characterised the transition to our modern period. The men who at last, after a time of fermentation, opened the paths of modern activity—Bacon, Descartes, and even Galileo—had all the large grasp, and each in his own way conceived the scientific task with the comprehensiveness and peculiar insight that mark the philosopher. So far as their influence prevailed in the seventeenth century—Descartes' in particular—against Scholasticism, which died hard in its own universities, there was no decline in the philosophic character of liberal instruction.

I might carry this review further, but I am content to have merely brought before your minds the connexion of the study of philosophy with the great stages of human history, if thus there may appear some reason for looking more closely to see what place it holds in the education of the present day, when public instruction has become the foremost social question for all.

First, for other countries, we may glance at France and Germany. In France, a course of philosophy, meaning logic and psychology, enters, nominally at least, into the secondary, or general liberal education of the *lycées* or public schools, and there is provision for prosecuting the subject specially, in the superior, or faculty instruction. In Germany, the study of late, practically, has vanished from the general or gymnasial course, except as it has been prominently brought forward again in the new liberal system of Austria; at the universities it retains the place it never ceased to hold, and now for a century has held in such a way as more than anything else to have procured for them their unique reputation, and for the country its place at the head of European thought. Thus a faint recognition of philosophy as a subject for all, more especially in France, and a striking acknowledgment of the importance of its special cultivation by a smaller number, especially in Germany,—this is what we observe in the chief Continental countries where the educational system has been recast for modern wants, on the definite principle of separating general and special training, and completely organising both.

In our own country there has been no general movement of reorganisation, nor, to aid us in appreciating the exact position of the subject, is there a uniformity of system. Still, amid the great difference of educational resources, appetite and results, from one part of the island to another, our teaching universities happened to agree in being first of all places of general education, and not seats of high special instruction like the chief universities abroad; special study with us, except in three professional departments, which, in a more or less perfunctory way, are provided with instruction, being left to private work, under a spur of honours examinations, or some other kind of reward. Now, evidently, one consequence of this for the study of philosophy must be that it is nowhere, unless accidentally, carried very far. But there will also be this other consequence, that where the subject is seriously taught at all, it will affect a large number, and, as a university-subject, probably affect them more deeply than if it were taught at school.

Both results are precisely what we find appearing in the Scotch universities—institutions that have long performed with credit the task of imbuing a very large proportion of the youth of the country with a liberal instruction, that has been found an admirable preparation for practical life, and a very good general basis for the few who have gone elsewhere to make special studies. Every one of the many Scotchmen completing a liberal education at home attends a long and serious course of lectures on logic, and another on ethical or metaphysical philosophy. I do not know another system of general education that either enjoins so much of high discipline, or manages to make it so effective. Germany, if she gets far more out of some at the universities—and let Scotland look to that—certainly gets nothing like it out of the many, either at university or gymnasium. And the system, on its strong side, has effects which may be traced not obscurely in British literature and science for the last 150 years.

The old English universities cannot be said, like the Scotch, to save their reputation by spreading wide the philosophical instruction which they do not carry far. At Oxford, the rival of Paris in the great days of scholasticism, and Cambridge, the seat of a school of thought as late as the seventeenth century, the study of philosophy, from a multitude of causes, sank to the lowest point in the eighteenth, from which it is still only in process of revival. As things stand, in discharge of their function of places of general education, both admit philosophical study, but it is not exacted as in Scotland. Higher study they encourage, the one by giving it a prominent place in the honours and fellowship examinations, the other by a special examination indeed, but one which hitherto has conferred barren honours in a region where academic honours are anything but barren. It would be wrong, nevertheless, not to acknowledge the ardour with which some have worked for the restoration of philosophy to a more worthy place in Oxford and Cambridge; and for this, as for other things, the future is full of hope.

I come now to ourselves in London, with our instruction and examination of purely modern origin, and constituted independently of each other. The examination-system of the University is particularly worthy of notice, being the most varied and comprehensive that exists, and specially calculated for present wants. The recognition of philosophy is very remarkable. For the B.A., or common degree in the liberal arts, as much knowledge is demanded as at the Scotch universities, and the higher degree of M.A. can be taken in philosophy, along with political economy, as a special subject. From a system of examination nothing more could be sought, either in the way of making the study general amongst men of liberal training, or of encouraging a few to go deeper. But the action of the university does not stop here. It grants also degrees in science, upon the guarantee of the matriculation test for general knowledge; and here, while requiring for the lower degree as much philosophy as for the B.A., offers the higher scientific distinction for special proficiency in the subject under the name of mental science. Again, nothing more could be desired, either for imbuing scientific men generally (for reasons we may have occasion to see) with a philosophic spirit, or for stirring up carefully trained scientific minds to the deeper investigation of philosophical questions, which too often, it cannot be denied, have been made the sport of poetic fancy or been taken in hand by those who were interested in a certain solution of them. Nor does even this complete the account of the recognition of philosophy. The University of London stands alone in requiring of medical graduates who aspire to the highest professional status, that they shall not be ignorant of the laws of the human mind and of scientific method, the neglect of which has been fatally avenged upon the progress of medicine; anticipating here a reform of medical education that cannot be far distant. It was not too much to speak of a very signal recognition of philosophy; and taking the university only for what it professes to be, one might say further, that there is in all this a very felicitous blending of ancient prescience with modern experience.

But if London stands thus distinguished in philosophical examination, it is only a reason the more for looking closely to the philosophical instruction; which brings us home at last, because University College, once the London University, claims still to rank first among the instructing bodies. And in support of the claim there could hardly be better proof than the fact that, beyond any other, this college has maintained in her curriculum the teaching of philosophy. The fact admits of even stronger statement. As the present University is more the daughter than the mother of our College, and certainly owes its breadth of spirit to the same movement of thought and even the very minds that begot us, we may consider that a great part of what is best in its constitution is not so much a something for us to work up to, as a recognition and expansion of principles that first were rooted here; and notably in this matter of philosophy. For our founders, at a time when the philosophical tradition had nearly died out at Oxford and Cambridge, and when, by a curious irony, they could not be more distinguished from those who sat in the seats of the schoolmen than in setting up a chair of philosophy to take an effective part in general education, instituted in this place the first chair of the kind in England. Still, with reference to this chair so intelligently conceived, one hardly knows, after the changes and experience of thirty years, how to speak. The large scheme of the University cannot be said to be very well met by the energies of a single instructor, especially in its higher developments. On the other hand, the apathy of our people for high culture, which has hitherto sadly prevailed against the generous efforts of the founders and guardians of University College upon all lines, has shown itself quite specially upon this, to the extent of leaving hardly used the little teaching-power provided. It is not only a curious, but a serious thing. Berlin gives employment to some ten publicly-recognised teachers of philosophy. London, even after the singularly striking testimony borne by the new University to the general and special value of the subject, finds one rather superfluous.[1]

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[1] Mr. Mahaffy, writing in the last number of the *London Student* about the Dublin University, complains, with great justice, that little account is taken in England of its progress, and even its very existence. I am the more sorry that these observations of mine come under this reproach, because, upon inquiry, it turns out that no place of education more deserved notice for its recognition of philosophy. The subject (only it seems to be made rather much an affair of book-work) is both firmly rooted in the ordinary course, and placed fairly on the line for academic distinctions. The Irish Queen's University also merited a passing notice for exacting attendance on a philosophical course.

Having had occasion to mention the last number of the *London Student*, Upon this review, hurried and partial as it is, I think we may say that, while philosophy clearly has lost its old predominance in liberal instruction from the days when a change of speculative theory meant an educational revolution, its varying position from country to country, and its more or less unsatisfactory position in all, betoken great disagreement and uncertainty about its value as a subject of study. Germany carries philosophy much the furthest, but one must go to Germany to hear its general utility scouted with thorough vigour. Scotland spreads it well, but has little training for special aptitude. England, at the old university seats, is only recovering from the habit of total neglect, or in London has not got much beyond the conception of a brave ideal. Under these circumstances, let me proceed to explain how, as I conceive, philosophy, though it stands no longer where it stood, still has claims to a place in modern education.

For the declension of philosophical study, reasons are not far to seek. To take the smaller first, it is plain that, as the world advances in culture, a literary education must tend to engage a larger number and increasingly to engross the mind. This was seen in the later ages of antiquity, when they became weighted with a great literature. It is to be seen still more since the Revival of Letters, when the nations of modern Europe got sudden possession of the literary relics of the classical peoples, and after a flush of bewildered admiration, began to pile up fine creations of their own. In the ancient world, philosophy was more powerful as an intellectual regimen before the days of widespread literary culture; and unless modern civilisation is moving onward to some new catastrophe, mankind can hardly again be seen in the position of the schoolmen, hugging for centuries a few philosophical ideas saved from

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a periodical started a few months ago, under the able guidance of Prof. Seeley and others, to work for the organisation of the higher instruction in London, I think it pertinent to add that this (October) number was the last in every sense. Nothing is, of course, more natural than the early death of an English educational journal; but the fate of this greatly dejects some who were simple enough to fancy that at last the time had come when such an one might live.

the flood, until the re-awakening of fancy and literary taste.

But this is not much against the influence of philosophy. If the paths of literature, when they open, entice multitudes to wander down them, the world never contains fewer difficulties to solve or tends any the more to cease from breaking in upon the mind's repose. The search for largest truth, which is philosophy, cannot slacken with the growth of literary culture and general refinement, unless the race is falling back; and if in modern days the old philosophical highway is trodden by rarer feet, the cause is more probably that other roads to truth have been opened. You may easily guess that I am thinking of the multifarious lines of modern science.

Now, however exclusively the sciences may be understood, or in whatever narrow sense the one word Science, as arrogated for the multitude of modern positive inquiries (but it means simply knowledge), is opposed to all or anything that has passed under the name of Philosophy, you shall hear no jealous complaint from me. The man must be blind indeed, who does not see that sentence has long gone forth against ancient preconceptions of nature, and that the special sciences of modern times have availed to give insight into things that baffled too forward minds in early days. Has something that men do not call philosophy come at truth, or say truths, which philosophy upon a different line tried hard, but failed to reach? I wonder what philosopher, that is to say, what deepest and widest truth-seeker, should not there find cause for joy. There is truth of fact, and truth of manner, and he will always deserve best, who seeks out anything in the truer way. Since there is a truer way than once was mainly followed, of arriving at some knowledge of the vast complex of nature, in the following of it there lies not only an explanation of the comparative decline of philosophy in the modern world, but, one can even say, a *philosophical* justification. Ancient, scholastic, even seventeenth-century philosophy, we are not to forget, sought to be physical science as well. The philosopher Aristotle was, in the strictest sense, the great scientific authority for ages, until he was dethroned by the philosopher Descartes. Both were, like Locke, Newton, and Harvey, rolled into one; except that Locke's philosophy was in some respects better, and Newton's physics and Harvey's physiology very much better. The days are gone of a universal oracle like Aristotle; a new Thomas, who should dispense to hungry youth all knowledge, human and divine, would be the Angelic Doctor indeed. When one thinks with what accumulated labour of generations, with what painful concentration upon details, the conceptions that are now set before the scientific student in any known department of nature have been spelled out, one need hardly wonder at modern impatience of philosophy, which, for the external world at least, used to mean crude generalising, rash deduction, and self-complacent projection of human fancies and likings.

But was there nothing, then, in that ancient habit of thought, which, even at the expense of our objective sciences, gave, in what was called philosophy, a unity to human knowledge that is strange to a modern ear? Is it enough for men—for thinking beings—to burrow, like many, all their days in holes and corners of the universe, without trying, or conceiving how they might try, in thought to take in the whole,—to be moved to ecstasy in counting the spots upon a butterfly's wing, or the facets of its eye, and to care nothing for the questions about human knowledge and human nature underlying all? We agree to protest against so-called philosophic disdain of things mean, or facts precise or exact; but is it everything to ticket and label all round, or is it the highest to have even weighed the planets and measured the interspaces of the stars?

It is not necessary to go to those who are directly interested to find the negative answer. The labours of a man like Comte, steeped in objective science, but convinced that all this random exploring of the last centuries must be abandoned for a course of wisely-directed intellectual effort, in view of the highest human ends, yield it: it is yielded recently in more than one striking statement of the bounds set for physical inquiry and avowal of a great region of human interest lying beyond. What, if we shall find here only a recurrence, of a partial kind, to the old and neglected idea of philosophy? Let us suppose a number of men, of wide scientific attainments, to devote themselves not to carrying further specific lines of investigation, but to knitting up the multifarious threads of inquiry, to weighing their relative importance for humanity, and evolving out of each lessons of method for the benefit of the rest. Such men —Comte himself is an example—could not, or at all events would not, be called men of science, but would do a greater work, in some respects a higher, because a rarer work, than detail inquiry, and would fairly claim to be called philosophical. Suppose another class of men, less concerned about external things than the shifting scene of human thoughts and feelings, to undertake the delicate task of gaining some intelligent insight into this strangest of complications; with this view, to fasten upon all outer manifestations of consciousness, even more as helps to conception than as facts, and, both here and in the far greater number of cases where such help can only be vaguely had, by analytic reflexion to labour at reducing the acquired and the complex to the rudimentary and the simple. Such men might not (except by Comte) be denied, as psychologists, the name of men of science; but, as facing the multitude of difficult questions regarding human nature which, though not unapproachable from the side of the physical sciences, can never by men be placed on the same level with physical questions, their work also gets the name of philosophy. Now, there always have been some in the number of traditional philosophers attempting, as far as their light went, one or both of these functions; and the functions being declared necessary in quarters where there can be no suspicion of interested feeling, there is already in this a plea for philosophy beside the sciences.

But now suppose still another class of men—though it best might be our second class, the psychologists—to be deeply impressed with a consideration which there is no reason for not ignoring in practical life, but which is also so habitually ignored elsewhere as rarely to enter the head even of men of science—the consideration, namely, that this great world after all is, and can be, only as it is mentally perceived or conceived, and that it is as idle for men to try to get out of the mental circle to an existence that is not thought or somehow experienced, as to overleap their shadows. Strange as this may appear to some of you, it is anything but a whim or fancy ; and it has undoubtedly been the profoundest conviction of many of the greatest minds. Does it not follow that in carefully studying all that we are conscious of—not, with the physical inquirer, as things and facts related to each other in an external world, but as objects of our thinking—any results we arrive at will have a permanent and universal validity, whatever be the specific data started from—will be true of all things, if true of thinking, and will be a truth not otherwise to be attained? The scorn that is so freely poured upon metaphysical philosophers, without a faintest thought of this, is a very cheap scorn. If we will think of it, we shall understand very differently the efforts of so many searching intellects from that early Greek time till now ; and yet without prejudice—perhaps even in truest devotion—to the cause of modern science.

Why did good physical science begin so much later in the world, and, such as they had it, count in Plato and Aristotle for so much less, than philosophy? Not, surely, because the Greek thinkers were wanting in the requisite intellectual force, or because their philosophy was play; but rather because their philosophical thinking sprang more directly from, and was a more pressing need of, their mental nature. Why is their philosophy to this day a power in the world, and why does it worthily engage the labours of the most vigorous minds, but because it includes wisdom and far-reaching stretches of thought, which some may refuse to call truths, but which are worth more, and are more needed, than bushels of the facts to which the name is given? Why is most of their physical science a mere antiquarian curiosity, or good for little but to point a scientific moral? Because they failed to see how far mere thinking can go, how sober it ought ever to be; because they had not learned that if it will try to cope with the infinite complexity of nature, it must start from a very firm ground of experience, and never be weary of alighting again to test and verify its conclusions.

There is a difference between not having a right to be, and straying in the attempt to compass too much. Philosophy strayed thus; and modern physical science, upon a hundred lines, had a revenge to take. But now that, by an ardour in pursuit beyond all praise, and a harvest of results, intellectual as well as material, scientific inquirers have brought things to this pass, that nothing is better established than the way of the sciences, nothing more certain than their future, is it not time to drop an opposition that is full of danger? If the philosopher erred when he fancied that from the height of his swift thinking he could take in the world by glances, the physical inquirer, in seeking laboriously to make good the error, is not therefore safe. He works with assumptions, of which he can render no sufficient account; and because he cannot, he often works wastefully. He works without having reflected upon human ends; and because he has not, he often works uselessly. He works by rules which he does not comprehend; and because he does not, he often works astray. Or, if he can render intelligent account of his assumptions, if he has reflected upon human ends, if he does apprehend the true force of his rules, well for him; but then he is to that extent a philosopher. When, in some distant and happy future, all men of science have become philosophic, and are as remarkable for depth of insight and width of view as now for patient and devoted search, it will be time enough to ask whether philosophy has not wholly passed into positive knowledge, as positive knowledge will then be conceived. Meanwhile, there is so much sifting and criticism of scientific assumptions to be done, and so much ordering and estimating of scientific results—there is such need of anticipative thought for holding our experiences together, and of reflective consideration of our mental life to settle how and where we stand, that the last thing we can afford to do without is a philosophy. And, besides, it is, after all, not a question of philosophy or no philosophy, but only of good or bad: for, as Aristotle said, men must philosophise.

You will observe, I here put the case merely upon the ground of a necessary relation between philosophy and every kind of special inquiry; not, however, that I think it cannot be argued upon a directer issue. It is not asking very much of the mind that it should labour to settle the questions it can raise, or, rather, cannot repress; and if, as many are rather suspiciously eager to suggest, the questions are not to be settled, we surely have a right to know the reason why. We cannot go on living, still less thinking, without stumbling upon numberless difficulties, reaching even to our very life and thought; and although, no doubt, some may choose for themselves not to face them, there are others who must be allowed to choose differently. Nor is mere settlement of questions everything; as the world goes, there is virtue for every generation in the raising of some: and when comparisons are drawn to the disadvantage of metaphysical philosophy from the settlement of physical questions, it may be enough, without retorting upon doubtful passages in the progress, or doubtful points in the present state, of the sciences, to reply that it very much depends upon the kind of questions and the kind of settlement. On the whole, I venture to submit that it never was of greater importance than now to recognise and have taught, under the name of philosophy, the best possible knowledge regarding the human mind; which will range over more than you would suppose, but will include at least this—an account of the growth and mature manifestations of mind in the individual, or psychology; the same for the race, which is the history of speculation; and in connexion with this or separately, the discussion of all largest scientific ideas, or Metaphysics; Logic, or the general science of proof and discovery of truth; and Ethics, or the science of human conduct. To this last, leading on to so much else, I have only distantly alluded before, though the whole case might be rested upon it; the others are an intellectual regimen, without which there can be no highest culture for men, and no true idea either of human power or of human impotence.

But if philosophy in this sense is still to be taught, it is plain, in the first place, that there must be opportunities for making it a subject of special study, were it only to train a competent body of teachers. Here, in London, this is one of the chief things we have to think of; the more, as already our instruction lags behind the admirable system of examination I exhibited to you. But the matter has a wider aspect. Now that our people are being shaken from their intellectual trance, if London should, as with its resources it might, become the centre of the world's learning and science, greater would be the need that human thought should here, in philosophy, labour hardest to grasp and guide the whole. For all our restlessness, we are taunted with being a narrow-visioned people; and we cannot deny even to ourselves that our achievements are not won without a waste of power, moral, intellectual, and material, enough to make the fortune of many a more frugal, or better-instructed race. The taunt, with our past in view, cannot have more than a passing truth. As for the waste of power, that is sheer senselessness, and must be stopped. Let our instruction be made the best, as it still easily may; let us put aside this late-born horror of theory, and be less afraid of thought for having sometimes strayed, assured that no hard thinking is ever quite lost. Our love of facts and devotion to practical results will not suffer for being so enlightened; while all the experience we have heaped up, and must ever continue laboriously to bring together, may perhaps yield an intellectual satisfaction to which there are few among us not strangers.

But it is as a subject of general study that I am more concerned now to recommend philosophy, in view of our actual teaching-resources, and to an audience like the present. The chair of philosophy and logic in this college was, as I said, founded to take part in the work of general, liberal instruction, and singly cannot, except very feebly, overtake special functions of the kind now hinted at. Before an audience, too, composed of students still at the stage of general training, I may best close my remarks by showing, as far as time will permit, the advantages of philosophy as a *general* preparation for the chief special pursuits that in the end must engage the liberally instructed. I do not stop to give reasons for the selection; but you will hardly call it unfair, if we confine ourselves to the scholar, the lawyer, the man of science, and the physician.

The scholar is a somewhat indefinite title, and may mean little or much. It means least when it designates the scholarly man of traditional English growth, who, being anything or nothing besides, does not seek in his scholarship more than a means of fine recreation or a standard of literary taste. Him we may pass by. It means something very serious, as suggesting a teacher of youth; which it does with a frequency in proportion to the prominence given to language, and particularly the classical tongues, in mental training. Putting here aside the great educational question now pending between languages and sciences, I will only say that, more especially if instruction is to be mainly linguistic and literary, the teacher will do well to have been led by psychological study to reflect upon the subject of education, and to conceive that at least the manner of instructing dare not be unscientific. The scholar may, however, be more. With the measure of insight that has fallen to him, he may set himself to explore all mental growths and creations of the race in language, literature, art, polity, religion. He may put together all his thought and research in a history of some people, or period, or phase of mental effort; perhaps calling up the past in order to win from it moral and political lessons for his own time, more impressive than any abstract teaching. From words or myths he may try to distil subtle truths about pre-historic races. You may call this science: it is, in any case, putting erudition to its highest uses. Now one can call up such and such a scholar or historian, in whom conscientiousness, labour and rhetorical gifts are nullified by an incapacity to appreciate the weight of conflicting evidence, to comprehend the springs of human action, to conceive of human destiny with large vision, for mere want of logical training and familiarity with the analysis of the psychologist and the wide conceptions of the philosopher. One can think of such and such another, in the present and past, whose insight and free range of thought stand first among their high qualities, and by themselves would be ascribed to the influence of philosophic studies. We have had great scholars in England at different times. Let me put a question. How comes it that of the immense number of English students, who were classical or nothing, trained in the last seventy or eighty years, so few have contributed to the remarkable philological achievements of this century? Till you bring a more likely explanation, I should ascribe it to the long eclipse of philosophy and the philosophical spirit at the old universities.

The pursuit of law, which some of you will follow, is a very striking case for remarking the need and advantage of a general philosophical training. Nothing can be more apparent than the connexion of positive law through jurisprudence with morals and psychology. Nor is there anything more, or at least that might become more, commonplace, than the fact of the pointed application of syllogistic theory in legal pleadings and decisions, especially under a system of judge-made law like ours. But our own law, in its present condition, is also quite otherwise an object of interest to a philosophically trained mind. Sharing with other systems a number of hazy notions regarding law of nature and the like, which, if generated by a lax, can be cleared up only by a rigid, philosophy, it continues, unlike others, to be twisted by haphazard growth into monstrosity. The simplest rules of logical definition, which, if in other matters, men did not observe, or try to observe, there never could be science or knowledge, our lawyers alone seem to claim the right to disregard. They have gone on through centuries referring, with a fatal ingenuity, the multitude of new cases to an inadequate stock of original conceptions loose in themselves; and the consequence is, that a good definition of a legal term is now hardly to be found. There is no work more pressing at the present day, or more fitted to fire ambition, than the scientific reconstruction of English law; and the student, eager to aid, will not find better training than a course of philosophical instruction, impressing the conditions of all rigorous thinking, and accustoming the mind to move with steadiness among largest conceptions.

Upon the relation of philosophy to the sciences I have already spoken at length, and touch the subject here again only to say a word for theoretical science as a professional pursuit. It is a feature of British science that it is left in great measure to the spare energies and chance leisure of busy practical men; much to whose credit it undoubtedly is that so many are found willing to undergo labour of the kind. But, either on a comparison of results, or upon the least reflexion, it is impossible to regard such a state of things as satisfactory; and at no point do we suffer a greater waste of power. To stop the waste, indeed, is difficult, until by developing public instruction we provide, as in some other countries, a large number of modest places to be held on the simple and effective condition of requiring for scientific work done merely a free and open exposition of it. It is not, however, that there is a want of actual resources, if one might here venture to suggest what a power the old universities have long had of stemming the evil, by affixing such a condition to only a few fellowships, diverted from being extravagant prizes for past undergraduate work. Suppose the thing had been done—rigidly done—from the days of Newton: where might we not have been now? The sooner something is still done, there or here, the better for our national reputation; and in proportion as we couple a philosophical culture with the special training of the scientific class, a point in which it is still open to us to surpass other nations, the better will it be for our science—and our philosophy.

The medical profession, concerning which I engaged to say a last word in the present connexion, has specially distinguished itself in the way just mentioned of working at pure science amid laborious practical duties; so that after all the name of physician is not greatly misapplied. Nevertheless it is asserted, and not denied, that our medical men, as a class, come greatly short in the matter of preliminary general training, scientific, and even literary. One can urge the charge altogether with less hesitation because a change for the better has already set in; and, in an assembly like this, there is least of all need to cast about for a mild expression of it, when by their presence here the future medical students of your number take the best means of eluding the reproach. Even the practice of such, however, will bear to be enlightened, to say nothing more of the immense stride the others have to take; and enlightened it may be by including in their general studies here the philosophical discipline offered in our course of instruction. It is little short of mockery to ask, what can be the use of such a discipline to a medical man? When existence is hanging by a thread, or is endangered by a subtle malady, whose secret is betrayed by few outward symptoms and cannot be approached by a rough experience, is a man to resign himself to one who has not the faintest idea of what is good evidence, and never has bestowed a single serious thought upon the mental moods that are more than half our human life? If it were true that logic and psychology will not give much help, the case is still one where people can ill afford to reject a very little; and what logic and psychology can do for a mind that comes schooled in them to the discharge of functions the most delicate and momentous, those who neglect them are not the best able to say. You who are so fortunate as not to have been thrown prematurely amid the distracting variety of medical studies, which is the only good excuse the others can offer for the neglect, are those of whom it may be asked that they should give the discipline a fair trial. The present experience is unfortunately not great, either at home or abroad—this, indeed, is the very point complained of; but, as far as it goes, it justifies me in saying that you are little likely in after days to regret any trouble less.

It has been assumed in these remarks that philosophical knowledge is not only good to have, but is best got from a course of systematic instruction. I must not close without a word about that assumption. When an unpopular subject has its claims thus pleaded, there will be many ready enough to concede them, because it can always be said the knowledge is of a kind that may be trusted to come of itself or with other knowledge; and logic in particular, as it is the philosophical discipline with the most obvious and urgent claims, is perpetually being shelved in this very plausible and convenient fashion. The subterfuge is a little too transparent; it is, besides, not very safe, for logic is not the only abstract doctrine that can suffer. Whatever may be known, or has to be practised, is better for being explicitly set forth; in that way far more can be known, and bad practice is rendered more difficult. And this is neither to deny, what is no doubt a fact, that some heads need very little formal instruction, nor is it to assert that everything that can be explicitly set forth ought to be made a part of general education. But there are few for whom Philosophy has no lessons, and I should hope it will now appear to you a subject of study with very peculiar claims upon all.

THE ENGLISH MIND.[1]

After expounding, by the mouth of a feigned Oxford student, one of the most characteristic products of English thought in this century—the logical system of John Stuart Mill—M. Taine proceeds, in his brilliant French way, thus to catch up his youthful champion of 'English Positivism,' as he calls it:—

"An abyss of chance and an abyss of ignorance. The view is gloomy: no matter, if it is true. At all events, this theory of science is the theory of English science. Seldom, I grant you, has a thinker better summed up in his doctrine the practice of his country; seldom has a man better represented by his negations and his discoveries the bounds and the reach of his race. The processes of which this thinker makes up science are those in which you surpass all others, and the processes which he shuts out of science are those in which you come short more than any. He describes the English mind when he thinks he is describing the human mind. There lies his glory, but there also lies his weakness. In your idea of knowledge there is a gap which, being constantly added to itself, becomes at last this yawning gulf of chance from whose depth, according to him, things come forth, and this gulf of ignorance on whose brink, according to him, our knowledge must halt. And see what comes of it. By cutting off from science the knowledge of first causes, that is to say, of things divine, you drive a man to become sceptical, positive, utilitarian, if his head is hard, or mystical, fanatical, methodistical, if he has a lively imagination. In this great unknown void which you set beyond our little world, the hot-headed or the melancholy can lodge all their dreams; and the men of cool judgment, in despair of gaining any footing there, have nothing left them but to fall back upon the search for practical receipts that may better our condition. It seems to me that oftenest the two dispositions meet in the same English head. The religious spirit and the positive spirit live there side by side and apart. That makes an odd mixture, and I confess I like better the way in which the Germans have reconciled faith and science."

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[1] A Lecture delivered at the Russell Institute in April, 1871.

It is cleverly said—too cleverly, for if in all generalities there is apt to lurk a mental snare, there is especial danger in the attempt to dash off with points of this sort the character of the manifold thinking of an old historic people. In phrases less sparkling, but of almost identical import, one of those very Germans has sought to describe the quality of *French* thought, and the names of many Frenchmen, Pascal for one, rise at the words. Nor, again, *have* the Germans succeeded so very perfectly at the task of reconciliation—certainly, not Kant, the greatest of them all. And yet it must be granted that those telling sentences embody an opinion of the English mind that does prevail abroad, and sometimes finds vent at home. As represented by our intellectual leaders, we pass for being gifted with much practical sense, with much insight into the relation of means to ends or interest in the sort of knowledge that gives immediate power over things; but are declared to be singularly wanting in elevation of thought or passion for the merely true, and to be utterly impatient alike of far-reaching principles and of rigorously drawn-out conclusions. The Germans deny us their ineffable *Geist;* the French deny us their inexorable logic. It is freely allowed that we have done considerable things in the positive investigation of nature or of external human relations, like those that come into political economy. It is not denied that somehow, with all our devotion to utilitarian knowledge, we have managed to preserve a vigour and freshness of imagination, whence has sprung a poetical literature as rich and lofty as any the world has seen; though it is some consolation to our critics to think that they alone can appreciate its worth. What is denied, as here by M. Taine in the earlier part of his oracular utterance, is that we are a people of ideas, to whom simple insight is the first and highest. Or it is sometimes more bluntly put, that we have no philosophy.

The charge is not, indeed, one of old date. Time was, not very long ago, when the character of an intellectually forward race was the last that would have been withheld from us. It would not have been gainsaid by the French who, for near a century, gloried in following upon the track of Locke and Newton. Neither was it grudged by the Germans, who about the same time were not only cultivating their taste upon English models before entering upon their own great era of literary creation, but received also, though some of their descendants have forgotten the debt, their most effective impulse towards philosophic thought from Locke again and from Hume. No higher than to the time of influence of the new German philosophy, begun by Kant less than a century ago, can be traced the origin of the opinion that we fall short as a people in philosophical apprehension; and of course the weight of the opinion must depend on the credit maintained by that philosophy. Now it is a fact that in this present generation the rising thinkers, both German and French, tend more and more to come back to the intellectual point of view so scornfully decried as English by their fathers. But let that pass. Enough, for the present, that the charge as currently urged is seen to be not over-deeply supported. What force there is or is not in it, we may make out upon a line of inquiry of our own—a line that shall be mainly historical nor that of short reach.

Let it however first be understood that by English is here meant in the broadest sense British, inclusive of Irish and Scotch. The chief effect of the extension, so far as regards the modern period of history, is to bring into the reckoning a number of thinkers that have given fame to the northern part of the island in the last 150 years; but to exclude the sister-country would, within the same time, throw out no less a figure than Bishop Berkeley, who, though of English extraction, was in Ireland born and bred. It may indeed seem questionable to include philosophers hailing from beyond the Tweed; for did not his majesty King George III., in the interest of English common-sense, forswear and renounce 'Scotch Metaphysics'? or, if that be not decisive, has not Mr. Buckle shown that all Scotsmen reason on a method the exact opposite of that which has become almost identified with the English name—and everybody knows that in philosophy the method is everything? Notwithstanding, I take leave to submit that there is no opposition between the English and Scotch minds; that there is no difference in their habit of thought, or rather in their mode of expressing thought—for it amounts to no more—that is not explicable from quite minor peculiarities in the social conditions of the two countries; that in the objects of their intellectual interest and the fundamental lines of their method there is a marked agreement; and, therefore, that the present inquiry must extend to both. No proof of these positions can be offered now, though a single point may be noted in passing. The modern Scotch thinkers, with rare exceptions, have been, like the German, professors, enjoying, in their own measure, the stimulus of a free university system. The representative philosophers of England, on the other hand, have been, with hardly an exception, non-academic in position, or even, many of them, anti-academic in feeling. It is a fact of no small significance, though it would be misunderstood if taken to mean that English thinking is by nature a mere reflexion of practical life. There was a time, long past indeed, when in England also the highest thought of the country found its utterance in the teaching of the universities, and such a time may come again. Nay, are there not signs that the day of professors is once more at hand, if not already upon us?

In gauging, historically, the philosophical performance of the English mind, those who rate it low and those who rate it high err alike, as it seems to me, in contracting the vision too much. Always it is presumed that the first note was struck by the famous Chancellor less than three centuries ago—the note that has been taken up and with mere variations repeated in the generations since; that, while the fundamental character of English thinking was once for all determined then, it was not at all determined till then; that before Bacon there was no philosophical thought in England, or none at least that could be called English. And doubtless no injustice is thereby intended to our country in particular, since no claim to a longer intellectual history is put in for any of the other great philosophic countries of modern Europe, unless, perhaps, for Italy; what thinking there was before the seventeenth century being, in the main, held the property of the one universal Western Church, in whose service all feeling of nationality was overborne by a master sentiment of devotion to the ecclesiastical system. But however plausible this view of pre-modern thought, it is decidedly superficial, no very profound inquiry being needed to discover national character, already in the dim light of that middle age and despite the crushing influence of the Church, asserting itself under the monk's cowl not otherwise, save more feebly, than in the later time, when the nations were free to go each their own way. Or, if there were a doubt on this point in the case of other nations, at all events, so far as England is concerned, there should be none. I proceed first of all to show, as briefly as may be, how actively the English or British intellect was at work in an age long before Bacon and towards a result which he and his followers are commonly thought to have been the first to conceive. Should it appear that men from these islands were the most forward spirits in that early time and led the van of European thought, the fact is one not to be forgotten in an attempt to take the intellectual measure of our country. If, further, it appear that the British thinkers were the first to break down a system of thought which British thinkers had been among the first to build up, and in so preparing the way of modern thought took ground in the manner of their better-known compatriots of a later day, the fact is one to be carefully impressed. I find the most distinct evidence that our people was from the first to be seen pressing forward in the intellectual race with a clear notion of what it would be at. No nation has kept more steadily to its line of thought, and that is not denied; but, also, none perhaps has thought so persistently. We seem to have had a line before any other modern people.

The scholastic philosophy, so greatly derided in the eighteenth century by those whom it no longer affected, and who for the most part knew nothing of the object of their scorn; so fiercely opposed in the sixteenth and seventeenth centuries by those whose whole mental action was an open revolt against its authority; but in still earlier centuries not less passionately espoused and extravagantly esteemed than it has ever been resisted or scorned—is the name for a body of thought worked out and a method of thinking pursued in more or less irregular fashion by ecclesiastics in the West of Europe during some six centuries until the fifteenth. The work of clerics for an avowed theological purpose, it yet covers all the philosophic activity of Christendom in those ages, because the Church—I mean the Western Church, for the Eastern was idle—drew to herself, trained and used all the thinking power of the countries under her sway. We are now perhaps in a position to judge of this philosophy, or at least can do so with better knowledge than was had in the eighteenth century and with more impartiality than could be felt in the seventeenth. That it was one of the highest achievements of the human mind, cannot be said. Though it took as much time in the working out as Greek philosophy and modern philosophy put together, it must count in the whole history of mental endeavour for greatly less than either. Wanting the reality and exactness of modern positive science and the depth of modern philosophic insight, it was not less devoid of the genial freshness and originality of Hellenic thought. What principle of growth it ever exhibited it was largely beholden for to the influence of Greek ideas, while itself had to be thrust aside to make way for modern knowledge. Nevertheless there *is* another side to scholasticism,—one that has been far too little regarded by its detractors, and has moreover escaped the notice of most philosophical historians, while for obvious reasons it is not brought into relief by Catholic teachers who still in these days think with the schoolmen and accept their philosophy as valid and unsurpassed. Sad as it is to think of the huge break in the path of advance of the human intellect—of some ten or more centuries, each a hundred years long, though in stalking over them we forget it, lying all so barren of intellectual fruit between the few bright centuries far off in which the tiny race of Greeks at a corner of Europe raised so many deepest questions and went far to settling some, and the two or three busy centuries close at hand in which the leading European nations side by side, first having come back to the old Hellenic point of view, have so widely extended the bounds of knowledge in the way of positive science and so profoundly scanned its bases in the way of philosophy—yet can we not blame schoolmen for being born into that middle age. But, rather, because we know in what a night the light of Greek thought after flickering more and more feebly in the first centuries of our era was finally quenched, while the nations were locked in death-wrestle and the great world-empire, falling into pieces or rent asunder, was being hewn into the first rough shapes of modern nationalities, should we deem it something that thinking began again at all, and more that, in thinking as they could not but think from the ground of blind faith where they stood, priests and monks should have been found not loath but eager to turn full upon their faith the light of old reason as it again broke slowly in from outer parts. All the world has heard of scholasticism as an oppressive system of pedantic belief: it has still to be known as a system of rationalism struggling to be. Few have any notion of the seething mental activity, fatally narrowed, no doubt, in its objects, of the eager questioning and even the muttered scepticism, buried away in the depths of that credulous age.

Let us take scholasticism for what it was—the best that the European mind in a hard time was able intellectually to effect, and see, then, what was the part played in its development first and last by countrymen of ours. When about the year 800, Charlemagne, having brought something like order out of confusion in the West, made his grandiose attempt to organise European society upon the basis of a double-headed supremacy of Emperor and Pope, and bethought him of setting up monastic schools to soften his rude people, it was in the old-established seminary of York that he sought for a director of public instruction and found his man in Alcuin; never at the worst had there been a time when at scattered points over these islands a feeble flame of learning had not been kept burning. When two generations later a thinker of real eminence appeared, the first in four centuries since the time of St. Augustin, and after all that interval began a second era of Christian thought as St. Augustin had closed the first, starting the problem of a rational interpretation of the faith which the school-philosophy was a long and weary series of efforts to resolve, the thinker was John Scotus Erigena sprung from the north country or from Ireland. When two centuries more had passed of blank confusion in Church and State, in the midst of which Christendom well-nigh went down, and again a beginning was made of intellectual progress, with better chance of continuance, the centre this time being Paris and the leading spirits Frenchmen, on no field whether of wordy dialectic or mystic contemplation did our countrymen hang back; and when in the twelfth century the first race of scholastic wranglers, subtle as they were, had by reason of their failure to confirm the faith won hardly more credit with the Church than they can gain respect from us, with their clearly manifested impotence to break open new paths of knowledge or even to reconquer of themselves the domain held by the Greeks, an Englishman, as was fitting, John of Salisbury, stood forward to speak of leaving verbal quibbles for practice, at the same time that he pointed to Aristotle as the effective guide to larger fields of knowledge. So, again, when with the thirteenth century the Church after its long struggle with the civil power from the time of Hildebrand to the time of Innocent III. had come forth supreme, had arrayed its standing armies of mendicant friars, and founding regular universities was prepared to uphold and spread its power by dominating education and turning to its own uses the weapons of worldly wisdom, specially that philosophy of Aristotle which as it gradually became known from infidel Arab sources was wrested by some to infidel purposes—another Englishman it was, Alexander of Hales, who first struck into that path of systematic reconciliation of faith and reason—of Church-dogma in its most particular form as elaborated in twelve centuries of Christian effort, and secular knowledge in *its* widest extent as compassed by the encyclopædic labours of the great heathen sage, which was consummated after the middle of the century by Thomas Aquinas. And once more, when in the Angelic Doctor's rational expression of the Church's faith the work of Scholasticism seemed to be accomplished, as, accordingly, that expression has ever since then preserved an authoritative character in the Romish Communion, by whom should the concordat be marred almost as soon as framed but by John Duns Scotus, and in a few years more be quite torn up but by William of Ockham, both Franciscan monks from this country? Nor, though he stands aloof from the main current of scholastic thought which here has been traced, is the name of another Franciscan, from the thirteenth century, to be passed over: Roger Bacon, almost the only man of his age, to whom the world of nature seemed, as it seems to us, the great quarry of human intellect, rather than a realm of evil from which the faithful, banned into it for a while, cannot too much turn away their eyes, may fitly close our roll of English thinkers in the middle age.

It should now be clear, even in such a rough tracing, that from the earliest appearance of modern national divisions and during a full half of their history, men of our race played a part of quite singular prominence in the general intellectual movement of Europe. Almost might one say that as long as the movement, from taking place within the fold of the universal Church, was in the strict sense a collectively European one, the start at every new stage of the course was due to the initiative of a British schoolman. And there is more to be said. As scholasticism is now of most interest as itself but a stage—not a bright one—in the whole intellectual course of humanity, what is of prime concern is how the passage out of it into the next was made; and at this crisis, while men of English name become more prominent than ever, a certain distinctive character begins to be apparent in their philosophic action. The prominence before, when mediæval thought was beginning from nothing, might be accidental; the English were a little better schooled, perchance because they lay out at sea, and then, as often later, had comparative peace, while the continent was in trouble. But long after, when an elaborate system of thought had been worked out, which, though it realised an ideal strained after through many generations, was no sooner an accomplished fact, than it must have seemed as a ponderous net thrown over free intellectual effort—that then the men who sought to cast it off, should all have sprung from the same soil, looks to be other than accident. Such action must have been natural to thinkers of that origin. Now, besides Roger Bacon, who for his interest in external nature is at once recognised as of English breed, and is readily supposed as in conflict with the spirit of his age, the schoolmen that broke away from the system that satisfied the highest aspirations of Churchmen in the thirteenth century are the two, John Duns Scotus and William of Ockham. It is worth while to look a little more closely into their mutiny.

The younger, William of Ockham, is the more important figure. Scotus, indeed, the terrible dialectician who refined and distinguished beyond all human belief to the extent of some twelve folio volumes before he was laid in his early grave at the age of thirty-four, was a most devoted son of the Church; and when he disturbed the settlement of Aquinas by denying that there could be a rational insight into the mysteries of the faith, did it expressly with the view of aggrandising the authority of the Church in the person of the Pope. With William of Ockham it was otherwise. Monk as he was, that rebellious spirit was the sworn enemy of papal pretensions, and though he also professed to bow in matters of faith to a Church whose creed he pronounced incapable of rational proof, in him, it hardly can be doubted, we come upon one, perhaps the first within the Church, more concerned, like a mere philosopher, to draw the line between science and ignorance, than as a theologian solicitous about establishing the faith. And for certain, in this English Franciscan, still deep in the middle age, three long centuries before the day of Bacon and Hobbes, we can descry, through the veil of his scholastic jargon, a thinker mentally akin to these—to Hobbes especially—in a fashion of which they in the indiscriminating impatience of their opposition to the scholastic system little dreamt. One might even marvel that 300 years should have had to drag out their slow length before the advent of modern thought in the seventeenth century, when this English schoolman in the fourteenth had so signally cleared the way for it, did not one gather but too unmistakably from the history of effective human thought, broken from the ancient to the modern time for 1300 instead of 300 years, that among the forces which in their shock make general human history the force of mere intelligence is far from being the most powerful. Much had to happen in the great world before philosophical ideas from which Ockham's were not far removed in substance, however much in form, could be enunciated so as to pass into the train of modern intellectual life; or before Lord Bacon could amid the applause of men preach that experimental investigation of nature for trying to practise which Friar Bacon in the thirteenth century had to sit long years in a dungeon and endure the bitterness of neglect. The fact notwithstanding remains memorable to us, that in the earlier time English minds were impelled as by some strong national instinct to work towards the far distant future; for it was not less the same instinct, because in Roger Bacon it assumed the guise of a craving after free search into nature, while in Duns Scotus it betrayed itself as an extravagant supernaturalism overshadowing science, and in William of Ockham it took the form of a critical scepticism looking askance upon theology. In all three it was a principle of opposition to the attempt to determine dogmatically how things must be, to measure the universe by a crude rational system. It was as if Roger Bacon said: Let not man by mere thinking or superficial deduction dream of penetrating to the inmost recesses of nature; as if Scotus said: Let not man dream of thinking out a highest reason of things—such he must take on faith; finally, as if William of Ockham said: Let man be content to inquire within the limit of his powers, and let him mind his steps even there. But to English ears that is a familiar strain; for it is the strain in which the leaders of English modern thought have spoken.

Bacon, Hobbes, Locke, Berkeley, Hume—such in the modern period is the succession of great names unbroken for 150 years, which represents the eagerness and persistence of philosophical effort in England; which represents also, as I think, with a singular completeness and consistency, the various possibilities of English thinking-power. Is it meant, that there are none,—that there never have been any,—among us, who renounce all such intellectual leadership? Is it meant that contemporary with these there were no other,—there were not many other,—names worthy to take rank by the side of them? Or, once more, is it meant that in the hundred years since Hume, we have been content to let him and these his predecessors think for us, and have not gone beyond them in logical method, in psychological analysis, in moral prescription, or in grasp of philosophical principles? Nothing of all that is meant. But it *is* meant that in every generation the thinkers or the philosophic writers amongst us who stand up for other principles than these in the main agree in representing or who acknowledge other masters, seem to rise and pass, leaving few traces of their work behind; that in the time of these, other names of repute are cast into the shade by them; and that in the later time the great advances that have been made in every field of philosophic thought, have been made so much upon the line and in the spirit of their inquiries—even the thinkers of the Scottish school having loudly vowed allegiance to Bacon—that it is needless, for estimating the scope and character of English thinking, to come down farther than to Hume. Hume's importance, in closing the series, lies in the fact that, till he appeared, the *questioning* faculty of the English mind, in its full subtlety and daring, stood unrevealed. William of Ockham had questioned boldly, but the memory of him perished amid the ruin that he wrought, and modern thought proceeded without the least regard to his foregone and forgotten scepticism. In Hume the revelation was such that no philosophical construction, since his time, in England can pretend to stability, if made without heed to his critical scrutiny of the grounds of human knowledge, while, on the other hand, any construction that has been raised beyond his power to overthrow cannot be very unstable. This is but another way of saying over again that later English work in philosophy—superior though it perhaps is to the work of those earlier thinkers—may for our present purpose be discounted. Now the five thinkers named from Bacon to Hume, whatever their difference of individual character and aims, display a greater general similarity of intellectual vision than can be matched, for such a succession of first-rate minds, from the history of any other modern people. The contrast presented by the course of thought in other countries is indeed quite remarkable. Thus in France the high speculation of the seventeenth century gave place in the eighteenth to observation of the soberest cast, this in turn yielding to higher speculation than ever in the nineteenth, till in those latest years inquiry of a positive sort has again begun to prevail. In Germany though there have been no such Gallic revolutions in the philosophic any more than in the political sphere, but rather the great systems of thought, as they have succeeded each other, appear singularly uniform in character, yet upon a closer view the distance is seen to be enormous from the dogmatism of Leibniz to the critical spirit of Kant, or again from Kant's sober reserve to the stupendous confidence of Hegel; while after the lapse of 150 years from the time of Leibniz, a general change of face may be said to have been made at last. No change of face is visible throughout the course of English philosophy, and we may truly express its general character in trying to express the common thought of our five representative thinkers. That human knowledge is a deposit from particular experiences; that it is strictly limited by the narrowness of human intelligence, which means that the sources of experience are in number fixed and that not great; that it is not more sharply defined outwards than it needs to be carefully elaborated within; that any attempt at extension of it, which is theorising, must never be more than a temporary anticipation of experience, to stand or fall as verification can or cannot be found; that it is to be sought after chiefly for the power it gives of bending the nature of things to human ends, as these can be best conceived; that where attainable it is to be sought absolutely without heed of human prejudice or authority; but that beyond nature which is thus and not otherwise to be known there is a region of the supernatural the relation of which to nature is not apprehensible by human reason and which altogether is to be accepted on faith. Such seem to be the main ideas of these English philosophers. It is not that all were put forward into equal prominence by each thinker, for the different aims of each could not in the same way be furthered, and the conception of some of the five was more profound than of the others; but this may be said, that the most coldly secular, the most sceptical, minds among them recognised, or made as if they recognised, beyond the sphere of natural experience and knowledge a sphere of supernatural interest, while the least worldly-minded of them—and one there was of almost faultless sanctity of soul—had for science an eye as sharply critical and a view as practical as any of their fellows. Of that mystic enthusiasm which when it is not impatient of all special knowledge substitutes a vain imagining for the laborious work of observation and reasoning, less is to be found in Berkeley than in any other saint. Of that mere worldly concern which is begotten of an interest in massing the facts and searching out the laws of external nature, or in tracing the growth of mind in its dependence upon external conditions, as little is to be found in Bacon or in Locke as in any other empirical thinkers. Or of professed, and perhaps real, regard for a sphere of interest surmised beyond the mundane region, especially when it is considered how inexorably they confine the mind to the knowledge of mere phenomena, there is not more to be seen in any minds of secular cast than in Hobbes and Hume. In all five the likeness of common feature to later English thinkers as well as to those early schoolmen, called up to-night from their sleep of centuries, is beyond dispute; and with their philosophic work in view we may now proceed, in conclusion, to draw out one or two of the more predominant aspects of English thought.

In the first place, then, no philosophy has come to terms, like the English, with the positive sciences; and that should be held a note of honour, if philosophy, as opposed to special science, claims to direct all human energies because it consciously comprehends them; for what cannot be doubted is, that the positive investigation of nature is the special work of modern times—the task to which we are irrevocably committed now, as to it we were irresistibly driven from the first. As little can it be doubted that English philosophic thinking is of the cast here indicated. Bacon's philosophy remains the stirring trumpet-call to modern scientific action, even when we hold it, as we must, by no means the true plan of campaign. Hobbes's philosophy is a premature attempt to be itself a body of the special sciences, ordered upon a principle and directed towards a practical end. Locke, with his perfect modesty, holds it for himself 'ambition enough to be employed as an under-labourer clearing the ground a little' for 'master-builders,' as he calls them, of the strain of Boyle and Newton. So Hume, when in lofty phrase he aspires to 'march up directly to the capital or centre of the sciences, to human nature itself,' and master that in his philosophy, has but this in view, that men may thence sally forth to make wiser and surer conquests in those fields of special science lying all about. And Berkeley, the pure spirit, breathing the air of mountain-tops, after the fancy of some; the moon-struck destroyer of the solid frame of earth according to the indignant or contemptuous common-sense of others—why, he, indeed, is at war with the men of science—Newton and his following—but only because of the rash liberties which, as it seems to him, they presume to take with the natural world of fact, and their precipitate theorising when experience should be taken as all in all. Now, with this attitude of English philosophers towards the laborious work on the fields of natural science, contrast for one moment the impatience of Leibniz, and Hegel's haughty disdain of the 'barbarian' Newton and his 'pitiful' experimenting. Whether the famous German judged rightly, as he certainly judged from a height than which no man has ever mounted higher, this is not the place to consider: he would be a bold man who should rashly say that he judged wrongly. But it may not be amiss to mention that in Hegel's own university of Berlin, within ear-shot of the academic chair whence his contempt of all English thinking and science for long years was wont to be poured forth, I have heard Newton spoken of as the greatest head the world has ever seen. Whether, again, this was the right judgment I can as little here venture to decide. Yet that it should have been pronounced in the very citadel of German speculation by a man of the first scientific mark does seem a rather striking tribute to the English habit of philosophic thought with which science of the Newtonian stamp so freely passes current.

But again this English philosophic interest in the positive sciences has had one striking effect—it has reacted upon the method of philosophic inquiry itself and tended to make this scientific: unless it be that we rather have here two collateral results of one natural disposition in the English mind. By scientific method in philosophy, I mean that in our highest efforts to comprehend in unity of thought the vast universe of being and to divine the origin and destiny of humanity—which is philosophy—we seek to proceed not by way of arbitrary speculation but from a basis of evident fact, we seek even more to bring all our reasonings face to face with fact as their final test, and always act as if we believed that to no one man can it happen that he should tear aside the veil and once for all lay bare the hidden mystery of existence, but that only by the united labour of many men and the continuous labour of many generations of men, as in the modern science of external nature, may the corner of the veil perchance be lifted higher and higher up. Now the philosopher's facts are facts of mind, or all possible facts taken, as all ultimately can and must be, as they are mentally experienced: and when such are scientifically investigated, there is psychology. This then is a second point: English philosophy is psychological. How true this is, and also how distinctive the description is, nothing could be easier than to show. From the time of Locke at least, if not of Hobbes, English thinking has been nothing if not psychological. And so, when other countries—France in the last century notably, and more than once in this, Germany in the last century also, though not in its foremost thinkers and therefore obscurely, but in the present century more and more signally within the last generation—have turned into the psychological path, English influence, not hard to trace, may always be seen at work. They have often laughed, Germans especially, from the height where they were labouring to fly, at our sober march below—as if much groping along nether ways could call itself philosophy! they have sometimes (it is worth our looking to see whether not now), getting upon the path by our side, truly strode forward while we were creeping. But at all events our march has not been broken; and the path we may call ours.

Once more, ours is a moralising philosophy. Not that the representative thinkers are moralisers by profession—for that is the business of weaker philosophers or other men; they are not even all moralists, which is something very different: and yet the phrase is fitly applied, if by moralising is meant the habit of turning all things to the account of human conduct. The charge has been laid against our whole literature that a vein of sermonising runs everywhere through it, the highest artistic effect being constantly missed that some practical lesson or other may be enforced. And certainly our philosophy or truth-seeking, while it has recommended and fostered the science which makes man master of the powers of nature to wield them for his ends, has also in its more immediate sphere been forward to draw from the limits of human knowledge the lesson that in good practice, far more than in vain search after the inconceivable, man best works out the possibilities of his being.

And now, in a word, to end as we began with our pungent but not unfriendly critic—a man whom the sombre vision that he conjures up has not deterred from working quite lately, with a genial power of his own, in the very track of English psychologists, and who more than any other is helping to restore the influence of English philosophical thought in France. Shall we accept his view of our position—that picture of the yawning abysses with tremulous mortals peering over the verge into darkness, and for want of sight, putting wild or gloomy fancies there as they draw back to sate eye and heart with the things of sense? We need not accept the picture, though we may have come to be able to conceive how it should have been painted. Its main lines are an attempt to portray a mental attitude which we have found some historical reasons for ascribing to the thinkers of our name. But the action gives a suggestion of helpless despair, and the colouring has a tone of gloom, that are imagined. Men of another name, it is adroitly hinted, are in a brighter case, have far glances into a region of light and see the things that are near with other eyes. It is hinted, but it is far from being made out. And if that is not made out, still less is justice done to the pertinacious ardour with which, as we have now seen, English thinkers have through ten centuries again and again essayed to face the mystery of the universe, or to the true philosophic wisdom with which, bowing the head at every repulse before the impregnable, they have turned to search out with a sterner determination the untold secrets of nature to which they held the key, and to do better what their right hand found to do. That, as it seems to me, is the characteristic note of English philosophy.

THE SENSES.[1]

SUPPOSE, by a wild stretch of imagination, some mechanism that will make a rod turn round one of its ends, quite slowly at first, but then faster and faster, till it will revolve any number of times in a second; which is, of course, perfectly imaginable, though you could not find such a rod or put together such a mechanism. Let the whirling go on in a dark room, and suppose a man there knowing nothing of the rod: how will he be affected by it? So long as it turns but a few times in the second, he will not be affected at all unless he is near enough to receive a blow on the skin. But as soon as it begins to spin from sixteen to twenty times a second, a deep growling note will break in upon him through his ear; and as the rate then grows swifter, the tone will go on becoming less and less grave, and soon more and more acute, till it will reach a pitch of shrillness hardly to be borne when the speed has to be counted by tens of thousands. At length, about the stage of forty thousand revolutions a second, more or less, the shrillness will pass into stillness; silence will again reign as at the first, nor any more be broken. The rod might now plunge on in mad fury for a very long time without making any difference to the man; but let it suddenly come to whirl some million times a second, and then through intervening space faint rays of heat will begin to steal towards him, setting up a feeling of warmth in his skin; which again will grow more and more intense, as now through tens and hundreds and thousands of millions the rate of revolution is supposed to rise. Why not billions? The heat at first will be only so much the greater. But, lo! about the stage of four hundred billions there is more—a dim red light becomes visible in

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[1] A Lecture delivered in the Hulme Town Hall, Manchester, on Wednesday, 3rd December, 1873.

This experimental fancy—rather apt to take the breath away—I quote from the German books where it is to be found, because it brings into line, in a striking way, the most of what physical science can tell us about the senses, and at the same time suggests a number of questions, which, though they go beyond physics to answer, are among those that we must try to deal with this evening. Physics, as you know, is the science treating of nature, or the world of matter; and it explains what it can of the changes or processes going on there by resolving them into motions, under some general laws that have been very certainly determined. Now a great part of all the changes in nature are in the sensible qualities of things, such as their colour, temperature, and the like; and for all the variety of these the physical inquirer seeks out an expression in terms of motion. That in the objects sound, colour, &c., are motions, however they may appear to particular senses, was long ago surmised; as, indeed, in the case of sound, which first began to be understood, the fact is often quite evident. Sonorous bodies like a bell or a drum or a musical string are plainly in motion, which may pass to other bodies, and in particular by one great body, the air, can be carried a long way. The motion in bodies when giving forth light or heat, and the medium—not air—which is the general bearer of that motion, have been much less easy to determine; but modern inquiry has practically mastered the difficulty, and the tremendous figures given in our fancied experiment are some of those assigned in all soberness for the number of vibrations per second in the all-pervading ether that go with simple sensations of heat and colour in us. There is no expression of the same definite kind for tastes and smells; the process there being of the chemical rather than of the mechanical sort. But a chemical action also is, in the last resort, intelligible to us only as a mode of motion; and thus we may say that all sensible qualities are resolved by physical science into motions in the objects. In touch, which has not been mentioned, the action is mechanical of the most apparent kind.

Now, coming back to our rod, whose whirling is supposed to communicate to the air and ether in the room motions of like rate to those caused in fact by sounding, hot and shining bodies, we may remark two things strange. The first is that its motion had no effect on the man except at particular stages, and within a definite range at each. Putting always aside the case of actual contact as practically out of the question, we note the blank before the first deep groan burst forth, the tremendous blank when the last screech had gone out until heat began to steal in, and again the immeasurable tract lying beyond the limit where light passed into darkness. The second fact is, that within a certain range the motion appeared differently as both heat and light. Why should one rate of the motion appear only as sound, another only as heat, and another only as light? Why should other rates among or outside of these not appear as anything at all? And why should one rate appear doubly as both heat and light? These are questions that do not concern the physical inquirer, whose work is done when he has got the sensible qualities into expressions admitting of definite measurement. But we must try to find an answer for them.

There can be no doubt in what direction we have first to look. The question is why bodies outside of us affect us in certain ways and not in others. Well, of course, that depends on our capacity of being affected. Our physical frame or body offers itself to be acted on by other bodies in motion, and the result in the first instance must depend upon what organs and what kind of organs it has for receiving the motion or stimulus. This it is the business of a different man of science, the physiologist, to determine; and within the last generation or two—not earlier—a great deal has been done for the physiology of sensation, however much remains to be learned.

In regular sensation, as of a colour or sound, there is an invisible disturbance in some part or parts of the mass of the brain within the skull. This disturbance results from an ingoing wave or current of invisible motion along the white fibrous lines called nerves. This wave or current begins at the outer ends of the nerve-fibres, where they are in conjunction with various microscopic structures, partly nervous, partly other than nervous; and these structures are reached by the exciting stimulus (which we have seen to be some motion, visible or invisible, in external bodies), through the parts or openings on the surface of the human body—eyes, ears, and the like—which are commonly called the organs of the senses. It is a very complex process altogether, and for true sensation all the stages are of account; yet some are easily seen to be of greater importance than others. Least important is the part played by the external organs, for these are often injured without sensation being stopped. Most important is the action of the brain, without which there can be no conscious state at all. For the rest, let us carefully distinguish between the nerve-fibres going to the brain and their endings in the minute structures. Nerve-fibres, by themselves, are mere conductors which, like telegraph-wires, may carry indifferently in either direction, and, though in the actual nerves, which are compound bundles of fibres, they carry only one way, they will carry any sort of disturbance, whatever it be, that is strong enough to rouse them at all. Thus the optic nerve may be excited by any strong pressure, and is not excited when acted on directly by the proper stimulus of light, which happens to be a very weak one. In short, the fibrous lines of nerve seem not to determine the character of the sensations had through them, any more than a telegraph-wire determines the import of the message sent along it. But, if the mere nerves are practically alike in structure and function, most varied is the structure of their endings at the outer organs. The endings in ear, and eye, and skin are quite different; and, again, at different parts of the same organ—as between the middle and sides of the back of the eye, or between the finger-tips and skin of the shoulders in the organ of touch —the variety of structure is very great. Note this second point, because we shall come back upon it later. It is the first point that concerns us now.

Besides the fibres, it should be observed that the nervous system includes another sort of matter, consisting of darker-coloured cells, extremely minute in size. These cells, wherever found—in little gatherings here and there, or compacted into a column at the heart of the spinal cord, or massed variously at the base of the brain, or packed away in the winding folds next to the skull-cap—are storehouses of pent-up energy, ready, upon the least excitement, to burst forth as invisible motion along fibrous lines laid from them. The fibres are in substance much less unstable, and besides, both singly and as done up in bundles, or again in the sets of bundles which are called nerves, are protected by sheaths along their whole length, the ends only being left exposed. Now, as the brain buried away in the skull is, in the regular process of sensation, thrown into action only by the disturbance sent up along the nerve-fibres from their tiny ends thus unprotected, the stimulus applied here must either be very strong in itself, or, if weak, must somehow be strengthened to produce an effect. And strong enough it sometimes is, as from a violent blow or burn on the skin, destroying the very tissue of the nerves where they end, and thence, by way of the spinal cord and brain, throwing the whole frame into convulsive spasms. More commonly however the natural stimulus, as we had already occasion to remark of light, is very weak. What strength, do you suppose, is there in those inconceivably minute ether-waves that reach us after travelling years and years through space from a glimmering star of the sixth magnitude? Or what violence is there in the air-waves bringing tidings that a pin has fallen on the floor? Unless there is some means of intensifying or multiplying the stimulus, it will tap in vain even where the sluggish fibres present open ends to it. Now, practically, there are such means. Specks of the grey unstable matter are found at many places joined with the fibre-ends, able to catch a stimulus too faint to be of any avail against the lazy indifference of these. It is as if an anxious inmate of a house, eager to learn news of some event, but unable to stir abroad, and distrustful of the porter at the door, should keep on the watch outside a small boy of his own flesh and blood, eager like himself, who should arouse the sleepy doorkeeper on every the least occasion. Other structures also are found in the eye, that seem to make the signal more marked by first changing its character. In the ear there are various devices increasing the effect on the nerve-filaments. Under the skin, wherever touch is delicate, hard little bodies are disposed, doing regularly for the fibre-ends what happens when a thorn finds its way there. To give you any idea of the delicacy and variety of the arrangements is here impossible, not to say that much still remains to be learnt; but there is this broad fact to be taken along with us—that the regular stimulation from natural agents, often a most gentle motion, is taken up at all by our nerves only when it has first been variously modified at the points where these stand exposed.

Let us now recall the questions forced upon us by the rod-experiment. First, there was that strange fact of breaks or blanks in sensation, with perfect continuity of physical stimulation. May we not say now that a great deal of stimulation can easily be lost upon us for want of proper means to take it up by the nerves? It is a question, at least at the first stage, of mere physical correspondence. You strike a string in one piano, and a string in another close by begins also to vibrate, while other strings remain quite still. So the nervous system, through the nerve-endings, responds with action of its own to some rates or kinds of physical motion, and does not respond to ether-vibrations above those of violet and below those of heat, or air-vibrations outside a certain range; because the eye, and the skin, and the ear, in those essential parts of them through which the nerve-fibres are affected, are constituted not otherwise than they are. Thus also may we account for the different sensibility of different people. Some hear sounds at both ends of the scale that average ears never take in; and others, with ears of less than ordinary compass, never hear a bat squeak or a cricket chirp. The like is true of vision, and the common fact of colour-blindness, blotting out for so many people some colours entirely, is now ascribed to the absence of certain of the minute elements in the retina or sensitive curtain at the back of the eye. And what is total deafness or blindness? This may be due to defect in the central organ of the brain, but also, though centres are intact and the nervous communication is perfect, let the truly sensitive parts in ear or eye be only a little changed, and then, while air or ether may surge and eddy as before, the clefts that were in consciousness will have become chasms, engulfing the sensible glory of the world.

The other question was how the same physical stimulus could at the same time be the occasion of sensations so different as heat and light. Well, but what a difference of organ there is at the skin and in the eye! If there is any meaning at all in speaking of bodily conditions for mental states, it is impossible not to connect with the difference of the minute structures under the skin and at the back of the eye both the fact that at the extremes of the whole sensible range ether-waves are caught up by one line which are not caught up by the other, and also the fact that within a certain mean range the same waves are caught up differently towards a different conscious result. See what takes place in another organ—the tongue. Through the tongue, at its tip, we not only taste, but also have a finer sense of touch than even in the fingers, and the curious thing is that the double duty is there done by a single nerve—not different nerves, as for heat and light. How can the same nerve, say from the same lump of sugar, take on impressions so different as sweetness and roughness? Perhaps the microscope tells when it tracks part of the fine nerve-filaments to little structures known from the analogy of the tactile organs elsewhere to be serviceable for touch, and part into little cup-shaped openings, which are most probably the nerve-endings for taste, since we know that in order to be tasted substances must first be brought to the state of liquid solution. After that the case of heat and light, where the organs are so very unlike, cannot at least be thought strange. The skin within itself presents still another instance of double sensibility, contact and temperature, which some would make treble by adding (in my opinion erroneously) a sense of pain. Whether it is here enough to suppose the nerve-endings the same and only the mode of stimulation, as it in fact is, different; or whether there must be supposed peculiar nerve-endings for each sensibility, are questions to be decided by positive evidence when it can be got.

It may now occur to some of you as not so difficult, from this point of view, to conceive of a great increase in our sensible experience, by merely supposing us to have other organs, or the present organs slightly varied, for catching up the stimulation that plainly is lost upon us. Why should our senses be limited to five, or some such number? Voltaire, in one of his tales, has a humorous fancy of people in Saturn with seventy-two senses, visited by a wanderer from the region of the Dog-star with the decent outfit of a thousand. Why not? Under our own eyes do we not see the lower animals often acting in a way that means, if not quite other senses than ours, at least senses of quite another range? But we must not stray into questions of that sort, when there are others pressing more to be answered. For, now that we have taken from physiology a rough notion of what happens in the human body, as before we took from physics a rough notion of what happens in external bodies, when there is sensation, we are still rather at the beginning than the end of our inquiry. Colour, for instance, which appears to be in bodies but is not there except as a dance of particles, which is had only through the eye and brain but is not there except as a current and explosion—is what in itself? And if not in the thing called coloured except in appearance, why does it so appear? Neither physics nor physiology can tell, but only, if at all, the science of mind, which is called psychology. I say "if at all," because even the psychologist will tell us what sensation is not, rather than what it is. This, however, is not surprising, for neither does the science of physics tell what motion is, but only takes it as a fact and discovers its laws. If this is all that can be done for something so evident as motion, much more may we expect it of a mental process like sensation, that cannot in the same way be made evident. The psychologist can search out and classify the kinds of sensations, can show many of them to be much less simple than they at first appear, and can discover the laws according to which they combine to ever new results. It is before the fact of sensation itself that his science, like all others, breaks down. There is nothing simpler to express it by. It is sometimes said that sensations are signs in consciousness of events that are constantly occurring in the material world; but though this saying has a good meaning and is true, it makes nothing plainer. The difficulty turns up again in the word consciousness. In fact, we are here face to face with the great mystery of our being, and must bow the head. The psychologist tries rather to comprehend how sensations, with other elements of conscious experience, conspire towards the inexpressibly varied result of our full mental life. Now sensations enter chiefly into our apprehension of the vast material universe stretching away on all sides from us, and the main question as regards them is how that can be.

Let us take the question in the simpler form that occurred to us before. Colours and the like, which are not in things nor in the brain, but in the mind or consciousness, appear to us all to be in the things. Why? It is no sufficient answer to say that as there is nothing but sensations in the mind —no direct apprehension of motions in the objects or organs —the mind can put into objects nothing else. Why is anything put outside at all? I cannot hope to give anything like a full answer to the question even in the simplest form; but some things may be said that have an important bearing on it, and that should in any case be stated in giving an account of the senses.

First of all observe that by no means all sensations are put outside of us into things. Besides the sensations of the five senses we have a great many other simple feelings, often called bodily feelings, and best spoken of under the general name of Organic Sensations, because they are connected with the action, healthy or diseased, of the vital organs. Of these none are referred to external objects in the way that colours or sounds are, and only some of them, like suffocation and hunger, are referred to particular seats in the body. Even in the five senses many states are hardly referred beyond the organs through which they arise. Tastes seem to us in the tongue; smells, often in the nostrils; sounds, not seldom in the ear. So also in touch the pain of a cut from a knife appears to us in the skin, and in sight the sensation of dazzling light is rather within the eye than without. The regular sensations of sight and touch are, however, referred outside. Colours always seem as if spread out in space, and distinct points of light appear to stand apart. The sensations of smoothness and hardness from the same knife that caused the pain in the skin, seem to us no states of ours but qualities of the blade. And less regularly sounds also and odours appear to come as if from things.

Observe next this other series of facts. While it is generally true of all these sensations that we are passive under them, meaning that in certain circumstances it does not depend upon our will whether we have them or not, there is yet a great difference among them, when they are present, in respect of our power to control them. We often have sensations which no action can modify whatever we do; whether we run, walk, stand, or lie, the discomfort continues, and all we can say is that it is "somewhere inside". Other sensations of the organic sort, less vague, and referred to particular seats, as the lungs, or stomach, or teeth, we do have some control over: by general pressure on the parts, or other local applications, we may often alter their degree. Greater, though still limited, is our control over states referred to the organs of special sense: though we cannot at once get rid of pains like those of a cut, or a burn, or a bitter taste in the mouth, we can act very directly to modify them. We can altogether get rid of the smells and sounds that are referred to external things—if not by merely turning the head, closing the passages with the fingers or otherwise, then, at the worst, by getting up and moving bodily away. Most perfect by far, however, is the control over touches and sights. Here there is an action or motion of the organs themselves. What so easily moved as the eye and hand? We can vary or discard touches and sights at will by simply moving the organs.

What may we make out from the two sets of facts thus running by the side of each other? In proportion as sensations are beyond the control of our active movements, they appear or remain with us as mere sensations. In proportion as they appear to be qualities of things, and cease to appear as sensations, they are subject to such control. Till some other element of difference be assigned, it is open to say that the absence or presence of active movement with them makes all the difference. That is not, however, the proper way to put it. It is a difference in our consciousness or mental experience that has to be accounted for, and the fact of active movement is nothing to the purpose if we are not conscious of it. But this is just what we are. Though I have before expressly kept it out of view, there is, by the side of all these sensations, another kind of simple conscious experience—the sense of activity put forth, now commonly called the Muscular Sense. In some respects it is like other sensation, and in some respects very different. It is like in being a simple experience, that is, one that cannot be brought to anything simpler, and also in being connected physically with the action of nerves. It is different in being the consciousness of active exertion, not of any affection passively received, and also on the physical side, because there is reason to believe that it arises in or with the fact of motor impulse being sent out from the brain by the nervous lines going to the muscles, not, like sensation proper, in connexion with nervous disturbance at the surface, which is passed up to the brain. The experience is had in or with all movements that we consciously make through our members, in every case of bodily strain (where our movement is resisted or impeded), in weighing things with our hands, in running over things with the eyes. Bodies as spread out in space and resisting penetration there, also the space we call free between bodies, cannot be apprehended without it. To see this, just watch the movements of a child making the acquaintance of new objects or a new place. I do not say more, because I do not wish to take you beyond the region of facts on to ground that has been disputed among philosophers for ages. It is too hard a question to venture on here, how sensations, when blended with our conscious experience of activity, may come to be transformed into the guise of sensible qualities in things. But we may look a little more closely at the two chief senses —touch and sight—that give us a perception of things as external.

We have already seen how touch and sight stand apart from the other senses, and there is still more to say on that head. However we may project outside of us the sensations of sound, or smell, or even taste, it is always into things already supposed tangible or visible, or both tangible and visible. Our world may be called one of sights and touches. An object spoken of comes before the mind first as it would look to the eye, if seen, or to the touch, if felt. This is true even of things that powerfully affect other senses, and have their value accordingly; for example, a piece of sugar, a rose, a bell. As I uttered those words, did not a representation of certain visible and tangible forms first rise before you, one bearing sweetness, another fragrance, and the third sound, either in fact or as a possibility? Now, why? The first remark to make is that, as a fact, all objects perceived by us do, or may, affect sight and touch, while by no means all affect the other senses. Most objects give forth no sound that ever is heard, no odour that ever is smelt, nor ever fall to be tasted. Though it may be, in the first two cases, only because our hearing and smell are not fine enough—though it may be quite different in many of the lower animals—the fact remains true of human beings. Remark next that smells and sounds (we may drop tastes as unimportant) generally, as it were, steal in upon us, without calling for any action on our part to become sensible of them; and, again, that there is a great deal of active movement on our part that brings on no smells or sounds. On the other hand, observe how, in touching and seeing, we are in general actively moving the hands and eyes; and, what is still more remarkable, that practically we never move either the body in general, or those most mobile parts of it, the arms and hands and the eyes, as we constantly are doing, without experiencing a variety of sensations of touch and sight. I say in these circumstances it is impossible, if it be true that bodies in space are apprehended through our muscular activity—it is impossible that their other prominent qualities, besides extension and resistance, should not be supplied by touch and sight.

But is it the case that we do not touch or see without moving our hands and eyes? By touch, with my hand at rest, I perceive this table spread out and hard; by sight I perceive this hall, and in it people, with eyes kept perfectly still. True, I had to move my hand into contact with the table, and my eyelids to open them; also, touching this table for the first time in the dark, I certainly should move my hand over it to know what it was, as still I must move my eyes about to take in the hall and people properly. It is the fact, nevertheless, that the mere outspread hand tells of an object spread out in space, and the mere open eye discloses a vast variety of objects.

The fact appears quite fatal to our view, and yet I venture to assert that there is no stronger confirmation of it, the organs of touch and vision being what they are. With different parts of the skin we touch quite differently, and see differently with different parts of the retina. Touch is best at the tip of the tongue and tips of the fingers, also in the hand generally. Sight is best within a small area known as the yellow spot, near the middle of the back of the eye. As the retina comes forward round the inside of the eye, it grows less sensitive; likewise on the skin there is a falling-off away from the hand, greatest perhaps on the back. The differences depend physically on the number of nerve-filaments going to the parts, and on the kind of nerve-endings found there, both (as we remarked before of the latter) varying greatly; but let that pass. In our mental experience the differences appear as some variety of quality or kind in the sensations. Thus an object bright-red, when held straight before the eye fixed, loses in brightness and even in colour as it is moved sideways; still more an unfamiliar object, first seen with the side of the eye, has a different look when it comes to be seen through the yellow spot in the middle. So a piece of cloth feels quite differently to the back and to the fingers. There is another and very striking way of bringing out the difference in touch. Two points of a compass felt as double at some parts seem one at others, and the differences as measured are most surprising. The tip of the tongue feels them double if only they are $\frac{1}{24}$ inch apart, and the tip of the forefinger if only $\frac{1}{12}$; but they must be held from two or three inches apart at the back and other places, or they will be felt as one point only. Hence the notion has been started that the skin should be viewed as a sort of mosaic, made up of little areas or plots of varying size—very small and closely packed at the sensitive places, and comparatively large elsewhere—each having its own quality of touch, not the same as at any other. Though the view has never yet been stated in a perfectly unexceptionable way, the idea conveyed as to the varying quality of the sensations is, I consider, substantially correct. Whenever two touches are distinguished, it must be because of some difference between them in consciousness; and the only difference that can be at bottom is of the kind called quality. We distinguish tastes by their quality, smells by their quality, sounds by their quality; and the different quality of musical sounds is now believed to depend on the different nerve-fibres affected. Why not also in touch, where there may be a difference, not of nerve-fibres only, but of nerves? I hold that in many cases we do actually feel the difference of quality, and that where we do not it is because the difference comes, as we shall see, to mean something else. In the eye there is no doubt about the fact, for there the difference of quality remains apparent.

If the difference is a fact, there must first be some means of discounting it in practice, whenever confusion might arise from the varying reports. The means consists in taking as a standard the report of that part of the whole organ which is at once most sensitive and most easily moved. For touch this is the hand and especially the finger-tips, the more sensitive tongue being not fit for general work; for the eye it is the yellow spot about the middle. The hand may truly be called *the* organ of touch, to which the rest of the skin plays a part like that of the web about a spider: let there be a suggestion of contact anywhere, and straightway the hand can be borne thither, to feel for itself. So in the eye:

no spider darts from its lair in the centre to any part of its web more deftly than the yellow spot turns round, with the swift and easy motion of the eyeball, to catch for itself the images thrown on other parts of the retina. The yellow spot can with like reason be called *the* organ of sight. Nothing is easier than the movement in either case, and accordingly it is often made when we fancy both hand and eye at rest; nay, it is very difficult, in touching or looking, not to make some movement of the organs. We come, however, not to need to make an actual movement in order to correct roughly the report of any outlying part. Because the differences in the quality of sensation all over the skin and eye are constant at each part, we learn by long experience to judge well enough for many practical purposes what the standard report would be without moving to get it. We still move hand and eye when we want to be quite sure.

Mark now what further happens in touch. The discrepancies, though got over as elements of confusion by translation into touch of the hand, remain at the different places constant marks of the respective movements necessary to bring the hand thither. Indirectly, also, two different touches will come to suggest the movement of hand necessary to pass from the one place to the other. That is to say, upon the theory of perception which I am here assuming, each kind of touch comes to be localised directly with reference to touch of the hand, and all indirectly come to be localised with reference to each other. The skin is thus again mapped out, and now in the true sense of a map, with every touch in a certain relative position. And so predominant does this new character become in consciousness, that, when now we have touches, we are apt to think of them first as lying apart in their places on the surface of the body, not as they may differ in quality among themselves. The change of character will not seem so wonderful, if we think how in the first months of our lives we were doing little else but feeling about over our bodies with the hands. Its own skin is the first surface that a child comes to know of as spread out in space, and, being itself everywhere sensitive, the skin becomes the direct measure of all surfaces in contact with it. Accordingly, when it is affected at different points, or over a certain extent, we at once perceive a number of objects, or one continuous object, spread out in a manner corresponding. For a rough and general apprehension of that sort there need be no actual movement now; but how much was there not in the past for that to have become possible!

So much for touch. The same does not happen in the eye, because sight itself has to be brought into relation with touch. Sight appears, indeed, to have nothing to do with touch when it opens up far horizons over the face of earth, and even brings within ken the great vault of heaven; but that is not the work of the eye alone. The ever-changing image on the back of the eye, though it imitates upside down, as far as a tiny flat picture can, all the variety of the great world, gives but a varied suggestion of the experiences to be had from moving up to objects and feeling them—an exact suggestion of objects in a room or on the earth which we can so touch, but a very crude and false suggestion, however beautiful a one, of the star-sown depths of space so utterly beyond our reach. For all its range and delicacy, the eye is but as a servant bringing spoil within the hand's rough grasp; and only has this compensation, that the mind, so to speak, the master of both, sets the acquisition after all to the servant's account. Wherefore, we speak of simply *seeing* objects, and we do, in fact, spread over their full dimensions, as apprehended by the moving hand, or imagined upon a corresponding scale, the colour which is the note of the eye's service. Now, because the eye, in spite of this recognition of its work, does not determine what we call the real size, shape, distance, and other such attributes of objects, but only supplies varied marks thereof, we are not to expect that the differences of quality in the sensibility of the retina should among themselves appear in such a new character as that acquired by those of touch. Without ceasing to be mere differences in kind of light and colour, they can each in that character become suggestive signs of such general movements of body as will bring about active contact with the objects. And thus with my eyes simply open and fixed, the mere gradations of optical effect, as determined by the structure of the retina, suffice to suggest to me such general apprehension of a hall with people in it as I thus get. It becomes a more distinct apprehension when I throw my eyes about and bring part after part of the retinal picture on the spot of clearest vision; but even so, what the eye does is still only to give a suggestion, though a better-marked one, of the experiences I should have in detail, if I were to walk about in the hall and feel over successively the various objects it contains.

I have thus tried to bring before you some aspects of a very great subject. How can there be a greater than the Senses, when here we have nothing less than the two worlds of matter and mind brought manifestly together? Though the subject could only be touched on the surface here and there, I may have given you matter for a good deal of thought. And if there were any need to draw a moral, it might be this, that as the firmest apprehensions and convictions, like those we have just been considering, may emerge from the slow growth of daily experience, we cannot be too careful, where we have things in our power, what we suffer our daily experience to be.

HOW WE COME BY OUR KNOWLEDGE.[1]

THE old question of the relation of Knowledge and Experience is generally thought to have passed into a new phase in recent years. Nobody now-a-days seriously maintains the sensationalist position of the eighteenth century. Even those who attach most value to Locke's way of thinking are ready to scout the notion of *tabula rasa*, and to allow that the old supporters of innate ideas, native intuitions or whatever else they were called, had a real insight into the nature of knowledge as manifested by every human mind. There is an element or factor in the individual's knowledge that is there before or, at all events, apart from that which happens to come to him by way of ordinary experience.

This other element or factor is now most commonly represented as an inheritance that each human being brings into life with him. The inheritance can perhaps be most definitely conceived in terms of the nervous organisation which, it is practically certain, is involved in all mental goings-on, but it must admit of expression in terms of consciousness also. We are to understand that a human child, being what he is—the offspring of particular parents, of a particular nation, of a particular race, born at a particular stage in the race's development—does know and feel and will otherwise than he would if all or any of these circumstances were different. Nor does this apply only to the general laws and limits of his knowing, feeling and willing: it must apply also to his simplest conscious experience of any sort. An artist's sense of colour or sound will be something different from a costermonger's, and not merely because of a difference in the experience they have had and stored up. Their sensible experience will have been of intrinsically different quality from the beginning; and the principle of heredity must contain the explanation of such differences, if it does explain the general uniformities to which intelligence appears to be subject in all minds alike.

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Confining attention, however, on the present occasion, with philosophers in general, to the uniformities of knowledge—such, for example, as the reference we all make of sensible qualities to a substance or underlying thing in which they inhere, or the conviction we have that every event has been caused—I cannot for my own part doubt that human beings are determined by inherited constitutions (mental *or* nervous, or mental *and* nervous) to interpret and order their incidental experience in a certain common fashion. In the absence of a definite mental constitution, which must be inherited because the corresponding nervous organism is inherited, there is, I think, no way of conceiving how human beings come by the knowledge that we seem all to have in normal circumstances; as, accordingly, when the inheritance is plainly abnormal—for instance, in idiots—the mode or amount of knowledge is clearly different from what it is in other men. At the same time it does not seem possible upon this line to get beyond a general conviction that the way of men's knowing is prescribed for them by ancestral conditions. Or, if the attempt is made to determine the details of our intellectual heritage, it seems impossible to stop and not fall into the notion that original endowment is everything, and a man's life-experience little or nothing, towards the sum of his knowledge. The latest phase of modern philosophic thought, then, becomes hardly distinguishable from the high speculative doctrine of Leibniz—that in knowledge there is, properly speaking, no acquisition at all, but every mind (or monad) simply develops into activity all the potency within it, not really affected by or affecting any other mind or thing. The notion is of course suicidal; for how can there be, on the whole, a progressive evolution of all, except there be action and re-action among individuals, as the condition of working up to higher and higher stages of being? Nevertheless, it is no exaggeration to say that the tendency of recent evolutionism in psychology is to reduce to a minimum, or even crush out, the influence of incidental experience as a factor in the development of the individual's knowledge. What can happen to the individual in his little life seems to be so mere a trifle by the side of all that has before happened *for* him through the ages!

Once recognise a more or less constant *a priori* element in knowledge as coming by way of inheritance, and what is then wanted for the explanation in detail of the uniformity that appears in the knowledge of different men is an adequate conception of the actual life-experience of individuals. It is truly surprising how meagre and artificial—artificial in the sense of coming short of the fulness of natural fact—the conception current among philosophers has been. Sensationalists in particular were concerned to take no narrow view of the case. In point of fact, they so read their famous formula about Sense and Intellect as to throw away a cause that in itself was far from weak. The notion was that children coming into the world had everything to do and find out for themselves. The world was there, and the little creatures, all naked without, and their minds like a sheet of white paper within, were thrown down before it, at once to struggle for bodily existence and to take on mentally what impress they might from surrounding things. If they managed to survive, as somehow they generally did, they were found after a time in possession of a certain amount of knowledge about the world and themselves; and (most remarkable!) this knowledge, though it might be limited, as of course children's knowledge must be expected to be, was yet so definite in each and uniform in all, that it had only to be expressed by a system of signs (which, after long doing without them, men had somehow agreed to use), and the children were turned into sociable creatures with whom it was possible to hold rational converse. Now it is not to be denied that, in working out their theory, the Sensationalists were the first to determine with some exactness the elements of sensible experience involved in many of our most important cognitions, and also those intellectual laws of association under which these elements are ordered or fused (as the case may be). But it cannot be allowed that they gave anything like an adequate analysis of knowledge generally, or, in particular, rendered a likely account of the way in which the swarm of jostling sensations and other strictly subjective experiences settled down and were transformed into the coherent and orderly mental representation of boys and girls beginning to communicate with one another and with their parents and friends. The least consideration, indeed, might have revealed the error of the point of view. Children are as little left to work out their knowledge for themselves as to nurture their bodies. If they were left to struggle alone against the world for bodily life, they would assuredly perish. If they were left to find out everything in the way of knowledge by themselves, they might (always supposing their bodily life sustained for the first year or two) come to combine sensible impressions for the guidance of muscular acts; but they would not be the rational educable creatures that even mudlarks, living the social life, are at the age of three.

'The social life'—in these words is indicated the grand condition of intellectual development which the older psychologists are far more to be condemned for overlooking, than they can be blamed for not anticipating the notion of heredity that has grown out of the biology of the present century. In the last century, other sciences had not advanced far enough to make scientific biology possible; and psychology, in as far as it depends on true biological notions, could not but suffer accordingly. But in the last century, as at other times, it was sufficiently plain that children, in being born into the world, are born into society, and are under overpowering social influences, before (if one may so speak) they have any chance of being their proper selves. To say nothing of the bodily tendance they receive—though this is really a fundamental condition of their ever having an intellectual development—let it be considered how determinate their experience is rendered by circumstances or the will of those about them. For long months—such are the conditions of human life—children are confined to the experience of but a few objects; and even these they become familiar with more through the direct action of others, carrying them about, than through initiative of their own. Apparently a restriction, this first effect of the social relation is, in truth, a potent factor in the development of knowledge. It supplies the best conditions for that association and fusion of impressions on the different senses which in some form must unquestionably be got through at the earliest stage of intellectual growth. Being destined to enter into a fabric of general knowledge, the discrete sense-impressions received by children must be elaborated in quite another way, and to quite another extent, than if, as in animals, they were merely to be used for the guidance of immediate action. It is no small thing for children, that the range of their early experience is so narrowed as to give them a chance of becoming perfectly familiar with all the details of it.

It is not, however, till a stage after the earliest—though still a very early one—that the effect of social conditions upon the intellectual development of children becomes most marked. Before they are themselves able to speak and become full social factors, they begin to have the benefit of the spoken language that holds a society together. What can better help a child to identify as one object a complex of impressions appearing amid ever-varying circumstances, than hearing it always indicated by the sound of the same name? The first business of children, before they rise to comprehensive knowledge, is to have a definite apprehension of objects in space; and to this they are helped not least effectively by the fact that there is a current medium of social communication about things, the advantage of which is, strictly speaking, forced upon them. Constraint there is, when one thinks how people are for ever obtruding names upon the child's ear, both when they have occasion to speak among themselves, and when they take occasion (as some are always found ready) to lavish attention upon babies. And though it may well be doubted whether children always relish the outpourings of social tenderness to which they must submit, there can be no question as to the intellectual advantages that, even through suffering, they receive. Their chief end, on emerging from infancy with their little stock of knowledge, is to understand and be understood by others; and, meanwhile, they have entered, without effort of their own, into possession of a store of names adapted to all the exigencies of intelligent intercourse.

But this is only the first, and not the chief, intellectual gain that accrues to children from the existence of ready-made language. Whatever the occasion may have been that first called into play the expressive faculty between man and man, it is beyond dispute that language is required mainly for purposes of general knowledge. The language spoken by a race of men is an accurate index to the grade of intellectual comprehension attained by that race, and the intellectual progress of the race may be traced in the gradual development of its speech. See, then, what comes to the opening mind of the child with the use of his mother-tongue. The words and sentences that fall upon his ear and are soon upon his lips, express not so much his subjective experience, as the common experience of his kind which becomes, as it were, an objective rule or measure, to which his shall conform. Why, for example, does a child have no difficulty about the relation of substance and qualities that has given philosophers so much trouble? and why do all children understand or seem to understand it alike, whatever their experience may have been? Why? but because the language put into their mouths, and which they must e'en use, settles the point for them, one and all; involving, as it does, a metaphysical theory which, whether in itself unexceptionable or not, has been found serviceable through all the generations of men. Or, to take that other great uniformity or law of knowledge which has become so prominent in philosophical speculation since the time of Leibniz and Kant,—why do we all assume that every event must have a cause? Let it be granted—though this is, perhaps, doubtful—that all men do and must always make the assumption. The philosophical difficulty is how any human mind can so far transcend its own limited experience as to make an assertion about all possible experience in all times and places, and it is well known how it has been met by the opposite schools: those at one extreme declaring in various phrase that it is the mind'snature, before all experiences, so to interpret any experience; and those at the other extreme making what shift they can to show how the conviction springs up with, or is developed from, the individual's experience. For my part, I can agree with neither.

I cannot go with those who declare that no amount of experience, in any shape or form, can be the ground of such conviction as we do, *in fact*, have of universal causation. But I can as little go with the other class of thinkers, when they suppose that a conviction like that is left to the individual to acquire by private experience or effort. Long before children have the least occasion to try what they can do in the way of generalisation upon their incidental experiences, it is sounded in their ears that things in the world are thus and thus; and that child were indeed a prodigy of pure reason who should pause and gravely determine not to take on the yoke of social opinion till he could prove it, of himself, well founded. He does—he must—accept what he is told; and in general he is only too glad to find his own experience in accordance with it. And if to this it be objected that children cannot understand the generalities they hear unless by reason of native principles in their intellectual consciousness, the answer is, that they do not by any means begin by understanding them. This comes only very gradually to the best of us, and to some comes hardly at all.

On the whole, then, the description I would give of our early progress in knowledge—and the early progress is decisive of our whole *manner* of knowing till the end—is something like this: that we use our incidental, by which I mean our natural subjective, experience mainly to decipher and verify the ready-made scheme of knowledge that is given to us *en bloc* with the words of our mother-tongue. This scheme is the result of the thinking, less or more conscious, and mainly practical, of all the generations of articulately speaking men, passed on with gradual increase from each to each. For the rest, I should be the last to deny, having before asserted, that the part we are intellectually called to play is predetermined for each of us by a native constitution of mind, which, on one side, assimilates us in way of thinking to all other men of our race and time, if also, on another side, it marks us off from all other men and contains the deepest ground of what is for each of us our proper self. But I desire to express the opinion that there is no explanation of any mind's knowledge from this position, even when account is taken also of all the modes of natural experience noted by psychologists, unless there is added, over and above, the stupendous influence of social conditions, exercised mainly through language. How far would his native mental constitution (whether regarded as an inheritance or not), with all his senses and all his natural activities, carry a child in the direction of knowledge, supposing him to grow up face to face with nature in utter loneliness? I believe it would need an effort which none of us can so far abstract from the conditions of *our* knowledge as to be able fully to make—to conceive how insignificant such a creature's knowledge would be.

It should be understood that the question raised in this short paper (written originally as a mere thesis for discussion) is a strictly psychological one. The psychologist's concern in knowledge is to show how it is generated in the mind. For this, he must carefully analyse knowledge, as it appears in himself and others, so as to have insight into the matter he would explain, and his work is done when he then shows how knowledge arises in each of us *naturally*. It is another and very different question—what knowledge is to be held as objectively true or valid for all minds alike. When is my knowledge such that I may claim your assent to it? To answer this question, or, in other words, to determine the conditions of scientific knowledge, belongs to philosophy in general or logic in particular, and remains an imperative task after any amount of psychological inquiry. But the psychological question, within its own limits, is a very real one, and it is indeed the natural, if not the necessary, preliminary to the other.

Even as psychological, however, the question is here in various ways narrowed. It is a question referring only to knowledge, to the exclusion of feeling and willing, and to knowledge only as it appears (naturally) with a character of uniformity among different men. The social influence insisted upon does nothing to explain the intellectual idiosyncrasies of each individual: these, if explicable at all in their variety, must be traced to special inheritance (as suggested above) or incidental experience. On the other hand, it is plain that the influence extends beyond intelligence proper to the other great mental phases of feeling and willing. The tendency of men to feel and act alike is indeed even more apparent than to think alike, and assuredly has its explanation not least from the social tie which, from the first, is as a spell upon the individual; though here again, it may be remarked, there is an ulterior question—whether the feelings and acts naturally excited in men, from association with their fellows, are justifiable in the sight of philosophic reason The effect of the social relation on the mental development of the individual is, I repeat, a purely natural factor for the psychologist to reckon with; or, at least, it is so in the first instance, however it may afterwards seem, on evolutionist principles, to carry its justification with it. Yet it has by psychologists generally been quite ignored.

The same century that has seen the development of the 'historical sense' has first begun to comprehend the relation of perfect solidarity subsisting between the individual and society, and for a very good reason. It is, in fact, but one conception differently applied—when the varied life or history of a nation is viewed as growing out of its past, and when the mental life-history of individuals is seen to be determined by the social conditions and traditions into the midst of which they are born. Nor is the doctrine of general organic evolution itself, the latest outcome of thought in the century, aught but a more extended and intenser reading of the same conception. So far as concerns the social relation in particular, it may truly be said that to no one thinker or school of thinkers belongs the exclusive credit of having grasped its import for psychological theory. The notion of man as never separable (except by abstraction) from the social organism has emerged at the most different planes of thought, and been suggested by various lines of scientific inquiry. Yet it were almost an injustice not to recognise the peculiar impressiveness with which it was proclaimed by Comte, considering where he stands between those who went before him and those who have come after. If he had much to learn in the matter of psychological analysis from the 'ideologists' whom his soul abhorred, the lesson contained in his protest against their individualism has in turn been too little or too slowly regarded. It is remarkable how much of the celebrated English work of the present century in philosophy or psychology has continued to be done from the individualistic point of view. Mill's theory of knowledge, for example, greatly as it is in advance of Hume's as a serious constructive effort, is yet only such a doctrine (whether of everyday experience or of organised science) as Hume himself might have set forth a hundred years ago, had he been really minded, as he at first professed, to work towards a positive theory, instead of spending his strength in pricking the bubbles blown by dogmatic metaphysicians. Professor Bain's psychological researches have been almost wholly analytic, in the manner of Hartley's: of extreme importance as such—witness, in regard to the very question of the sources of knowledge, his discovery (for it was hardly less) of the element of muscular activity in objective perception—yet merely adding to the list of formal factors involved in a complete psychological construction.[1] Mr. Spencer, it is true, has always looked beyond the individual for an explanation of the facts of mental life, intellectual or other, but he has concentrated his energy as a psychologist on the elucidation of the principle of heredity. It is only in more recent psychological works, like Mr. Lewes's, or as yet in less systematic essays and general literature, that the social influence of man on man is forcing its way to recognition as a factor second to none in the actual process of mental development.

A few words may be added, before closing, on one question that suggests itself. How does the recognition of social influence in the development of the individual's knowledge affect the position now commonly called Experientialism? It is here conceded, as a matter of fact, that no one's knowledge is explicable from his individual experience. Although, of course, there is a sense in which all that a man knows must have been experienced by himself, it is nevermore true that it depends upon the individual as such, either actively or passively, what his knowledge shall be. Doubly, as we have seen, is he beholden to his fellows. He comes into the world what he is, even on the most strictly personal side, through his ancestors having been what they were and done and borne what they did in their time. And no sooner is he in the world but he enters upon the heritage of social traditions in the speech and ways of his kind. Not his to wrestle by himself with a confused and perplexing experience, if haply he may attain to some rude construction of a world not too unlike that of other struggling human atoms. His task at the first is but to accommodate his experience to well-approved working rules supplied from without, which more than anticipate his wants; nor is it other to the last, unless he be one of the few in each generation who, having assimilated existing knowledge, are moved to enlarge the intellectual horizon—to pluck up the stakes where they found them and plant them farther out for others slowly to work up to. The experientialist doctrine thus appears wholly at fault if it means (as it has often been taken by supporters and opponents alike to mean) that all intellection was first sensation in the individual, or even (in a more refined form) that general knowledge is elaborated afresh by each of us from our own experience. Neither position can be maintained in psychology. And yet it is notorious that exactly those who now urge the presence of such *a priori* and *ab exteriori* factors in the individual's knowledge as are here contended for, and are not the least forward to make light of incidental experience, set most store by the teaching of the older experientialists, and would affiliate their doctrine upon the work, such as it was, of Locke and Hume. For this there is a deeper reason than is commonly assigned. It is common to say that inherited aptitudes are, after all, only a slower result of experience, developed in the race instead of the individual; and the like may be said still more evidently of the social tradition deposited in the growing languages of mankind. The real bond, however, between experientialists at the present day and those of an earlier time is that both declare experience to be the test or criterion of general knowledge, let its origin for the individual be what it may. Experientialism is, in short, a philosophical or logical theory, not a psychological one. The fact that the pioneers of scientific psychology in the last century were experientialists in their philosophy is not without significance, but the two spheres of inquiry should not therefore be confounded. One may be Lockian in the spirit of one's general thinking, without allowing that Locke or his immediate successors read aright the facts of mental development. It is as a philosophical theory that experientialism goes on steadily gaining ground.

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[1] It should be noted, however, that in one of his most characteristic researches—his doctrine of the growth of Volition—Professor Bain has by no means confined himself to the analytic attitude; and here it is interesting to observe that he distinctly posits the social influence as a factor in the development, when showing how volition is 'extended' by imitation.

ANALOGY.[1]

ANALOGY is the name in logic for a mode of real or material inference, proceeding upon the resemblance between particulars: speaking generally, it is that process whereby, from the known agreement of two or more things in certain respects, we infer agreement in some other point known to be present in one or more, but not known to be present in the other or others. It was signalised already by Aristotle under the different name of Example (παράδειγμα), the word Analogy (ἀναλογία) having with him the special sense of mathematical proportion or resemblance (equality) of ratios. The earliest use of the name in its current logical sense is to be found apparently in Galen. While, in popular language, the word has come to be vaguely used as a synonym for resemblance, the logical authorities, though having generally the same kind of inference in view, are by no means agreed as to its exact nature and ground. It has chiefly to be distinguished from the related process of Induction, in their conception of which logicians are notoriously at variance.

Aristotle, distinguishing Syllogism and Induction as passing the one from whole to part (any part), and the other from part (all the parts) to whole, notes under each a loose or rhetorical form—Enthymeme under Syllogism, and Paradigm, or Example, under Induction. Thus, to give his own instance, it is an inference by way of example—if a war to come of Athens against Thebes is condemned because a past war of Thebes against Phocis is known to have been disastrous. Here the reasoning, which may be said to pass from part to part, is resolved by Aristotle as compounded of an imperfect induction and a syllogism; the particular case of Thebes against Phocis started from being first inductively widened into war between neighbours generally, and the particular case of Athens against Thebes arrived at being then drawn out by regular syllogism from that major. Example, or, to speak of it by its later name, the inference from analogy, is thus presented by Aristotle as directly related to induction: it differs from an imperfect induction—what is now often called real or material induction from particulars incompletely enumerated—only in having its conclusion particular instead of general, and its datum singular instead of plural.

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[1] Reprinted, by permission, from the *Encyclopædia Britannica.*

Kant and his followers, while maintaining a relation between induction and analogy, mark the difference otherwise than Aristotle. By induction, it is said, we seek to prove that some attribute belongs (or not) to all the members of a class, because it belongs (or not) to many of that class; by analogy, that all the attributes of a thing belong (or not) to another thing, because many of the attributes belong (or not) to this other. In this country Sir William Hamilton has adopted this view (*Lectures on Logic*, vol. ii. pp. 165-174), though he differs from Kant in understanding it only of the process called applied or modified induction,—not of the pure form of reasoning from all the parts to the whole, which, in the manner of Aristotle, he puts on a level with pure syllogistic deduction. The relation and difference of the two processes may be formulated in the short expressions: One in many, therefore one in all (Induction); Many in one, therefore all in one (Analogy). For instance, it would be an analogical inference—to conclude that a disease corresponding in many symptoms with those observed in typhus corresponds in all, or, in other words, is typhus; whereas it would be an induction—to infer that a particular symptom appearing in a number of typhus patients will appear in all.

The view of Kant and Hamilton does not reach below the surface of the matter, if it can be maintained at all. In the first of the examples just given the inference might well be a good induction, all depending upon the kind of symptoms that are made the ground of the conclusion; on the other hand, the second might be a case of mere analogy, not to be called induction. Neither, again, is Aristotle's view satisfactory, which practically makes the difference to depend upon the mere quantity of the conclusion, worked out as particular for analogy by appending to the induction involved a syllogism of application. Since the universal always carries with it the particular, and cannot be affirmed unless the particular can, the two processes become to all intents and purposes one and the same. If the particular or analogical conclusion is justifiable, it is because there was ground for a good induction (only not of the pure sort); if there was no ground for a good induction, then, upon Aristotle's resolution, there can be no ground for the particular inference either. Should it be said, indeed, that the peculiarity of the case lies not so much in the conclusion, as in the start being made from one particular instance, whence the process gets its name Example, that undoubtedly will distinguish it from anything that can seriously be called induction; but then what becomes of the resolution that Aristotle makes of it? That resolution can be upheld only at the cost of the character of the inductive process.

The logician who has done most to elaborate the theory of real or material induction, John Stuart Mill, has also been able to give an interpretation of analogy, which, without in the least severing its connexion with induction, leaves it as a process for which a distinct name is necessary. According to him, the two kinds of argument, while homogeneous in the type of their inference, which holds for all reasoning from experience,—namely, that things agreeing with one another in certain respects agree also in certain other respects,—yet differ in respect of their degree of evidence. In both the argument is from known points of agreement to unknown; but, whereas in induction the known points of agreement are supposed by due comparison of instances to have been ascertained as the material ones for the case in hand or conclusion in view,—in other words, to be invariably connected by way of causation with the inferred properties,—it is otherwise in analogy, where it is only supposed that there is no incompatibility between the inferred properties and the common properties, or known points of resemblance, that are taken as the ground of inference. Thus, if by comparison of instances it had been ascertained, or otherwise it were known, that organic life is dependent on the bare possession of an atmosphere in planetary bodies rotating upon an axis, then it would be an induction to infer the presence of life upon any heavenly body, known or as yet undiscovered, in which these conditions should be detected. With our actual knowledge, confined to the case of the Earth, and only enabling us to say that the absence of an atmosphere must destroy life, the inference to such a planet as Mars, where the conditions stated seem to be present, is but analogical; while to the Moon, which seems to have no atmosphere, the inference has not even this amount of force, but there is rather ground for inductively concluding *against* the possibility of organic life. Upon this view it ceases to be characteristic of analogy that the inference should be to a particular case only; for the inductive conclusion, when the evidence is of a kind to admit of such being drawn, may as well be particular; and, again, it may equally well happen that the analogical inference, where nothing stronger can be drawn, should have universal application. Notwithstanding, it will be found in general that, where the evidence, consisting of bare similarity of attributes in two or more particular instances, permits only of an analogical inference being made, the extension in thought takes place to particular cases only which have a special interest, and the mind hesitates to commit itself to a general law or rule. Mill, therefore, though he does not raise the point, is practically at one with Aristotle and all others who make example or analogy to consist in the passage from one or more particular cases to a particular new case bearing resemblance to the former. It is his peculiar merit to have determined the specific conditions under which the passage in thought, whether to a particular or a general, acquires the authority of an effective induction.

Analogy is so much resorted to in science in default of induction, either provisionally till induction can be made, or as its substitute where the appropriate evidence cannot be obtained,—it is also much relied upon in practical life for the guidance of conduct,—that it becomes a matter of great importance to determine its conditions. Whether in science or in the affairs of life, the abuse of the process, or what is technically called False Analogy, is one of the most besetting snares set for the human mind. It is obvious that, as the argument from analogy proceeds upon bare resemblance, its strength increases with the amount of similarity; so that, though no connexion is, or can be, inductively made out between any of the agreeing properties and the additional property which is the subject of inference, yet (in Mill's words), " where the resemblance is very great, the ascertained difference very small, and our knowledge of the subject-matter very extensive, the argument from analogy may approach in strength very near to a valid induction. If (he continues), after much observation of B, we find that it agrees with A in nine out of ten of its known properties, we may conclude, with a probability of nine to one, that it will possess any given derivative property of A" (*Logic*, b. iii., c. xx., § 3). But it is equally obvious that against the resemblances the ascertainable differences should be told off. For bare analogy, the differences in the two (or more) cases must as little as the resemblances be known to have any connexion, one way or the other, with the point in question; both alike must only not be known to be immaterial, else they should fall quite out of the reckoning. As regards the differences, however, this is what can least easily be discovered, or is, by the mind in its eagerness to bring things together, most easily overlooked; and, accordingly, the error of false analogy arises chiefly from neglecting so to consider them. Thus, if the inference is to the presence of organic life of the terrestrial type on other planetary bodies, any agreements, even when extending to the details of chemical constitution, are of small account in the positive sense, compared with the negative import of such facts as absence of atmosphere in the Moon, and excess of heat or cold in the inmost or outermost planets. To neglect such points will not simply make the analogy loose; but, as the very point in question is concerned in them, the analogy becomes false and positively misleading. Still greater is the danger when the things analogically brought together belong not at all to the same natural classes, but the resemblance is only in some internal relation of each to another thing of its own kind; as when, for example, under the name of motives, particular states of mind (feelings, &c.) are supposed to determine the action of a man, as the motion of a body may be determined by a composition of forces. In such cases there may be nothing to prevent the drawing of a good analogy upon a strictly limited issue; nay, there may even sometimes, in special circumstances, be ground for drawing an inductive conclusion; but generally the elements of difference are so numerous, and their import either so hard to appreciate, or, when appreciable, so decisive in a sense opposite to the conclusion aimed at, that to leave them out of sight and argue without reference to them, as the mind is tempted to do, vitiates the whole proceeding. What is not sufficient for analogy may, however, be good as metaphor, and metaphor is of no small use for expository purposes; while (as Mill says), though it is not an argument, it may imply that an argument exists.

The sense just mentioned of a resemblance of relations suggests the question how far the common argument from analogy and mathematically determinate proportion, which was originally called by the name, are cognate processes. Undoubtedly the common argument, proceeding upon resemblance in the properties of things, can be made to assume roughly the guise of a proportion,—*e.g.*, Earth : Mars : : Men : Mars-dwellers, or Earth : Men = Mars : Mars-dwellers, the fact of planetary nature, or other resembling attributes gone upon, being regarded as common exponent. Less easy is it to interpret a determinate proportion, with numerical equality of ratios, as analogy in the common sense: for here the very determinateness makes all the difference.

The name analogy is so suggestive to English readers of Bishop Butler's famous treatise, that a word, in conclusion, seems called for on the nature and scope of the particular application of the process made by him. His work is entitled *The Analogy of Religion, Natural and Revealed, to the Constitution and Course of Nature*, and consists in an attempt to convince deists that there are no difficulties urged against revelation, or the system of natural religion, which do not bear with equal force against the order of nature as determined by Providence. The argument is a perfectly fair one within the limits assigned, and Butler must be allowed the credit of very well apprehending the logical conditions involved in it. In his introduction he understates rather than overstates the strength of his position; for, on the assumption that the system of nature and the system of religion must both spring from one causal source, his argument acquires rather an inductive character. Accordingly, it is interesting to see how, in connexion with his sense of analogy, he practically raises, in his Introduction, the question which the general theory of inductive logic, as now understood, has first to consider,—the question, namely, "whence it proceeds that *likeness* should beget that presumptive opinion and full conviction which the human mind is formed to receive from it"; though he would not take it upon him to say "how far the extent, compass, and force of analogical reasoning can be reduced to general heads and rules, and the whole be formed into a system".

ANALYSIS.[1]

Analysis means literally, in the Greek, an unloosening or breaking-up, understood of anything complex in which simpler constituents or elements may thus be brought to view. It is this general sense that must be supposed to have been present to the mind of Aristotle when he gave the name of *Analytica* to the great logical work in which he sought to break up into its elements the complex process of reasoning; as, accordingly, in the body of the work (*Anal. Prior.*, i. 32), we find him once using the verb "analyse" of arguments, when they are to be presented in "figure," or brought to the ultimate formal expression in which they can best be tested or understood. Obviously any more special sense that may be ascribed to the process of analysis must vary with the kind of complex to be resolved. Mental states, material substances, motions of bodies, relations of figures, are but a few examples of the complex things or subjects that fall to be analysed, if there is to be any scientific comprehension of them. Nor is it only that the analysis will be into constituents differing from each other as much as the complex subjects differ; for the same subject may be analysed in different ways, and with very different results, according to the particular aspect in which it is considered. Hence it becomes impossible, or at least very difficult, to describe the process in any terms fitting equally all the variety of its applications. It is from taking stand by some particular application, and either overlooking all others, or trying to force them within the frame of the one, that different writers have given such discrepant accounts of the process—discrepant often to the extent of being mutually exclusive. The express object of the present article will, on the contrary, be to give an unprejudiced view of the different applications of analysis in science, that one being first and most prominently put forward which was earliest recognised and practised, namely, mathematical analysis. The other applications, selected for their representative character, will, as they follow, naturally suggest the consideration how far the difference of matter in the various sciences tends to modify the nature of the process which is called analysis in all.

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[1] *Encyclopædia Britannica*, 9th ed.

By the side of Analysis, at the different stages, we shall at the same time treat of the related process called, after the Greek, Synthesis, which means a putting together or compounding. If analysis and synthesis were merely related to each other as mutually inverse processes, expository convenience alone might be pleaded in favour of the parallel treatment; but the two are in practice often employed as strictly complementary processes, in support of each other on the same occasion; or, in other words, the composition in synthesis may be a direct re-composition of the principles or elements then and there got out by analysis. As a matter of course, therefore, the foregoing general remarks apply also to synthesis, especially the remark as to the modifying effect of difference in the subject-matter worked with.

I. *Mathematical Analysis and Synthesis.*—In the *Elements* of Euclid, containing so many examples of geometrical propositions variously established, there is a scholion near the beginning of Book XIII. which distinguishes two general methods for the treatment of particular questions, under the names of Analysis and Synthesis. In analysis, it is said, the thing sought is taken for granted, and consequences are deduced from it which lead to some truth recognised; synthesis, on the other hand, starts from that which is recognised, and deduces consequences therefrom, till the thing sought is arrived at. With more detail, but some wavering in his use of terms, Pappus of Alexandria (about 380 A.D.) describes the two processes at the beginning of Book VII. of his *Mathematical Collections*. He appears, however, to regard synthesis not at all as an independent process to be applied alternatively with analysis for the solution of particular questions (which is the view suggested by Euclid), but rather as a complementary process bound up with the use of analysis. These are his words: "In synthesis, putting forward as done the thing arrived at as ultimate result in the way of analysis, and disposing now in a natural order as antecedents what were consequents in the analysis, we put them together, and finally come at the construction of the thing sought". The two processes are involved together in what he calls the τόπος ἀναλυόμενος, or, as we may call it, one general Method of Analysis, the use of which for the solution of problems, he says, has to be learned after the *Elements*, having been developed by Euclid himself, Apollonius of Perga, and Aristæus the elder. In a similar sense, Robert Simson, its modern editor, speaking of the Euclidean book of *Data*, calls it "the first in order of the books written by the ancient geometers to facilitate and promote the method of resolution or analysis". Beyond Euclid, however, the invention of the method was carried back by the tradition of antiquity to Plato. The philosopher, whom we know to have been an ardent student of geometry, and otherwise a discoverer in the science, is said by Diogenes Laertius (III. i. 19) to have devised the method for one Leodamas, and is further said by Proclus (*Comm. in Eucl.*, ed. Basil, p. 58) to have made much use of it himself. Though the report is a loose one, it may well be that this method of analysis was first expressly formulated by the theoretic genius of Plato, especially in view of a passage (*Eth. Nicom.*, iii. 5) in Aristotle, which has not been sufficiently noticed, showing that in his time, before Euclid was born, it was currently employed by geometricians. Aristotle there compares the gradually regressive process of thought, whereby the means of effecting a practical end is discovered, to the mathematical way of inquiry upon a diagram, remarking of both that the last stage in the analysis (ἀναλύσει) is the first in the production or construction (γενέσει). However surprising it may be thought that Aristotle in his logical works makes so little of a process which thus must have been familiar to him, the fact that it was familiar carries it back at least to the time of Plato. In truth it must have been practised earlier still, from the very beginnings of scientific geometry, though it may have had to wait some time to be formulated.

Taking analysis and synthesis, thus defined, either as distinct processes or as conjoined in one method, called analytical, we have next to see how they were brought to bear by the ancients in treating geometrical questions. Propositions such as those contained in the *Elements* fall into two classes with respect to the form of their enunciation, namely, theorems and problems. The distinction was not marked by Euclid himself, nor is it in any sense radical, for either kind of proposition may easily be transformed into the expression of the other; but, as commonly accepted, it amounts to this—that a theorem is given out as an assertion to be accepted, and has to be shown true; a problem is given out as an act to be done, and has to be shown possible. In the case of a theorem, Euclid accordingly, after enunciating the proposition, proceeds generally to show, with more or less construction on a particular diagram, and working always with fixed definitions, that the assertion follows deductively from certain truths, either assumed as evident (axioms), or formerly proved therefrom, and seen to be applicable to the present case by inspection of the figure as constructed. The grounding propositions are allowed by the reader as they are brought forward, though he may for the moment have not the least idea whither the author is tending, and at the end the conclusion is accepted, because the successive premisses, being allowed, have been combined logically. In the case of a problem, after an express construction for which no reason is given, the object is to show that what has been brought to pass really supplies what was sought; but the procedure is not different from what it was in the case of a theorem, because the object is attained by showing again that certain truths allowed, in their particular application to the figure constructed, involve as a conclusion some relation which the figure is seen to exhibit. Now if this is Euclid's procedure in general—there is an exception, afterwards to be noted, where he proves his point indirectly—it is undeniably synthetic, in any meaning that can be ascribed to that term, the result being obtained by a massing or combining of elements or conditions. But on Euclid's part the process is one of demonstration, not of discovery. Still less is the reader's mind in the attitude of discovery: he is led on to a result which is indeed indicated, but by a way which he does not know, and, as it were, blindfold. There must, however, have been discovery before there could be such demonstration; or how should the proposition admit of definite enunciation at the beginning? Thus there is, in the background, an earlier question of procedure or method, and it is this that the ancient geometricians had chiefly in view when speaking of analysis and synthesis.

Now, some propositions are so simple that they must have been seen into almost as soon as conceived, and conceived as soon as the human mind began to be directed to the consideration of forms and figures; in which case no method of discovery, to speak of, can have been necessary. There is, again, another class of propositions, more complex though still simple, which probably were established by a process of straightforward synthesis. An inquirer must have in his head some knowledge in the shape of principles more or less fixed, or he would not be an inquirer; and either the accidental combination of such principles may lead in his mind to particular results, or the first time a particular question suggests itself to him, it may be seen at once to involve, or to follow from, certain of the principles. Many propositions in the *Elements*, giving the most apparent properties of triangles, circles, &c., it can hardly be doubted, were arrived at by this way of discovery, even when a more elaborate process of synthesis was employed for their formal demonstration; as, for example, in the case of the famous fifth proposition of Book I. But the same process of direct composition (understood always as joined with inspection) is no longer applicable, or is not effective, when the question is of less obvious properties, or of construction to be made under special conditions. To discover the fact or the feasibility in such cases is so much the real difficulty, that the question of demonstration becomes of merely secondary importance. And there is even a still prior question of discovery; for it has to be determined that some points rather than others should be made the subject of express inquiry. This, however, may be left aside. To any one engaged in geometrical inquiry, in the constant inspection of figures for the understanding of their properties and mutual relations, questions must incessantly be occurring—so incessantly and inevitably that it is needless, if it were not vain, to seek out a reason for the particular suggestions. As in all discovery to the last, so more especially at the first stages, there is an element of instinctive tact in the mind's action which eludes expression; and there is also an element of what might be called chance, were it not that those only get the benefit of it who are consciously on the look-out, either generally or in some special direction. A particular question being started by whatsoever suggestion, how shall the mind arrive at certain knowledge regarding it? Such, practically, is the form which is assumed by geometrical inquiry.

Besides the thing sought there is nothing else given, or at least there is nothing else immediately given or suggested. But the mind is supposed to have some knowledge pertaining to the matter—though not extending to the particular aspect of it—in question, also some knowledge of such matters generally. In such circumstances the aim of the inquirer must be to bring what is sought into some definite relation with what is known. Direct composition or synthesis of the known, with more or less of construction, if it led to that which is sought as a result, would determine the relation for the inquirer, and determine it in like manner for all who allow the principles whence the conclusion is logically deduced, being thus at one stroke both discovery and demonstration. But synthesis, arbitrarily made, as it must be where the question is at all difficult, may fail, however often it is attempted. Without a proper start it avails nothing; and what is to determine the start? There is always one course open. Let the objective itself be made the starting-point, and let it be seen whether thence it may not be possible by some continuous route to get upon known ground. In other words, a thing sought, when itself assumed, may admit of being brought into relation, upon some side or other, with the body of ascertained knowledge. If it can be so brought, through whatever number of steps, there is then attained as a result what before it was impossible to light upon as a beginning; and now nothing hinders from making the start originally desired, and from reaching as a proper conclusion the assumed beginning, if the path struck out before is measured over again in the opposite direction. The course thus becomes once more synthetic, but only because of what was first accomplished. Till the point in question was made to yield up its own secret by a process fitly called analysis or resolution, nothing certain could be determined. At the analytic stage, however, the line taken may be twofold. The proposition, assumed at starting as something definite to work from, either may be held as following deductively from some other, which again is dependent on still another or others, till one is worked up to that is known to be true; or it may be taken as itself a premiss leading deductively to some other proposition, which in turn, by one or more steps, leads to a true proposition as conclusion. In either case the implication is that a proposition must itself be true, if by any line of formally correct logic it leads to a proposition known to be true. And though the expression must be modified for questions in the form of problems, requiring something to be done—to which form of question, indeed, the analytic process is peculiarly applicable—the point of logical principle remains there exactly the same.

But is the process, thus stated as it was understood by the ancient geometricians, logically valid? In the first of the two alternative forms, it is valid: the proposition assumed at starting will undoubtedly be true, if a proposition on which it is shown to be ultimately dependent is true. At the same time, there is in this case no guarantee that the most effective line for establishing it has been taken, in view of the well-known logical principle that the same conclusion may follow from different premisses. In the other form of the process, where the proposition assumed is itself used as a premiss, the case as to validity is otherwise. As Aristotle first clearly apprehended and showed, it is quite possible to reach a (materially) true conclusion by strict logical deduction from premisses either one or both false; and thus the mere fact that the proposition assumed is found, in combination with others, to lead to a conclusion known to be true, does nothing to establish its own character. Yet although the process of analysis thus carried out by way of deduction, as formulated by Euclid and (in one of his expressions) by Pappus, is theoretically faulty, through neglect or ignorance of Aristotle's observation, the practice of Euclid is not therefore invalidated. It was his habit, as Pappus also enjoins, to follow up the analysis by a synthesis consisting in a reversal of it, and this would effectively get rid of error; since the result of the analysis, if it did not follow from the assumed premiss by true implication, but only accidentally, could not itself, when in turn used as a premiss for the synthesis, be made to yield the original proposition as a legitimate conclusion. In order, however, to validate this form of analysis it is not necessary to resort to the laborious expedient of retracing the whole path synthetically. As Duhamel, in his treatise *Des Méthodes dans les Sciences de Raisonnement* (pt. i. c. 5), has pointed out, it is enough if, at the different stages of the deduction, the inquirer assures himself, as he easily may do where it is the fact, that there is perfect "reciprocity" among the propositions successively obtained from the one first assumed; meaning that, in the circumstances of the deduction, each may as well follow from the one coming after as it is fitted to yield that. And the same simple expedient suffices equally to obviate the less grave defect above noted in analysis carried out by regression from consequents to conditions, or conclusions to premisses; reciprocity, if it can be made out here at the different stages, will guarantee the exclusive validity of the line of reasoning taken. So may analysis become perfectly independent as a method of discovery, and give as much insight as synthesis, where this is directly applicable, does; while it is—what synthesis is not directly—applicable to every kind of question, however complex.

It is unnecessary, for the purposes of the present article, to enter further into details respecting the methods anciently practised in geometry. Let it suffice to mention only the method of indirect proof known as *reductio ad absurdum*, employed sometimes by Euclid in the *Elements*. This conforms to the type of analysis in that it starts from the question to be determined, though it is peculiar in following out, not the assumption itself, but what is thereby suggested as excluded, with the final result that the point in question is established upon the ruin of every other supposition. It is a method of discovery as well as a method of demonstration; while the previous argument has shown that analysis, directly practised, may be made a method of demonstration by itself, besides being the most potent and unfailing instrument of discovery. Also it was seen before that synthesis may be a method of discovery, though it is more frequently employed as a method of demonstration in sequence upon discovery by analysis. To insist thus upon the double character alike of analysis and synthesis, as practised in geometry, is of vital importance, because of the change in application which the terms have undergone among mathematicians. In modern times analysis has come to mean the employment of the algebraical and higher calculus, and synthesis any direct treatment of the properties of geometrical figures, in the manner of the ancients, without the use of algebraical notation and transformations. The excuse for the change lies in the fact that, while the Greeks had only extremely undeveloped means of analysis, they gave the highest possible finish and exactness to their synthetic demonstrations and geometrical propositions, seldom being content to let their discoveries rest upon the ground of that analysis by which they were made. But though it has this excuse or motive, the change involves a misunderstanding, as all mathematicians allow who have turned their minds seriously to consider the *rationale* of their practice. It is, in the first place, clear that only by the process described above, rightly called analysis, can anything be determined about the more complex properties and relations of geometrical figures; haphazard synthesis is of no avail. The ancients therefore, in their geometry, had an analysis. It is next to be remarked that the algebraical solution of problems is not so exclusively analytic in character that it may not in simple cases assume the form of direct (algebraical) synthesis; and in all cases, for verification, it admits of being followed up by an exposition that is truly synthetic. The moderns, therefore, in their calculus, are not without their synthesis. Furthermore, the ancients, however little progress they made, comparatively speaking, in the general science of calculation, and however their special methods for the resolution of geometrical questions, even as involving direct figured construction, still more as applying calculation, fell short of the variety and pliability of modern devices, yet had their own analytical weapons, though they cannot be specified here. For our present purpose it is equally unnecessary to enter into details as regards the modern devices, whether belonging to the lower or higher analysis, or as regards the principle for applying them developed by Descartes and his successors; but to arrogate for these exclusively the name of analysis, it cannot be too pointedly declared, is to lose sight of the end in the means.

II. *Chemical Analysis and Synthesis.*—After mathematics, chemistry is the science in which application has most expressly been made of processes termed analysis and synthesis. In physics, regarded as the science of motion, whether abstractly taken or as manifested actually in natural bodies, the application is universal; the resolution and composition of velocities, motions, and forces being fundamental processes pervading the whole science under all variety of circumstances. There is nothing, however, in such an employment of analysis and synthesis that is not easily intelligible in the light of the processes as practised either in the more general science of mathematics, dealing with relations of quantity in number and form, or in the more special science of chemistry, which deals with those characteristic qualities of actual bodies for which no definite expression in terms of motion can be found.

The concrete substances in nature are found to be such that some by no means in our power can be brought to anything simpler, while others can be broken up into constituents differing in character from the original substances and also among themselves. Hence a division is made of bodies into elements and compounds; elements being all such bodies, not farther reducible, as are either actually found in nature, or, though not so found, have emerged in the manipulation of actual bodies; compounds, all such as, being actually found, are reducible to two or more different elements, or have by artificial combination been constituted. The process of reduction to elements is called analysis; the process of re-combination or free combination is called synthesis. When the analysis is carried out simply with the view of detecting what elements are present in a substance, it is called qualitative; and quantitative, if with the further view of determining the definite proportions (by weight) in which the constituents are present in a definite quantity of the substance. There are corresponding varieties of synthesis.

Now here the subject-matter is so manifestly different from what it is in mathematics, that it is idle to look for exact correspondence in the processes practised under the same names within the two sciences. In fact, however, the correspondence is greater than may at first sight appear. Chemical analysis of a given substance is a process of discovery real and actual, like the analysis of a mathematical problem, and proceeds similarly by taking what is given, and working with it in relation to other substances, to see whether it can be made to yield up aught that is already known, or may be regarded as fixed and certain. Again, just as mathematical synthesis may be a process of invention, either generally, by way of combination of principles, or sometimes specially, in reference to particular questions, so does chemical synthesis give a knowledge of new forms of matter, or haply solve the question as to the constitution of particular substances in hand. Once more, the relation of analysis and synthesis as two complementary phases of one process (instead of their being regarded as two processes) is exhibited as plainly in chemistry as in mathematics. It may seem to be exhibited even more impressively, when the very constituents got out by analysis of a substance are used in the synthesis to give it being again. This circumstance, however, is far from giving to the science of chemistry a character of evidence superior to that of mathematics: its inferiority in this respect is but too well marked, and has a reason that at the same time explains what else is peculiar in its application of analysis and synthesis. The chemist deals with things known only by experience, and connected by way of physical causation: true, they are things with which he can freely experiment—and this gives to chemistry a prerogative character among the natural sciences—but the things are taken as they are found, and experience is constantly disclosing in each new attributes, which have simply to be accepted, at least in the present state of our knowledge, by the side of the others. On the contrary, the mathematician deals with things over which he has full power of construction, and whose relations in the fact of constructing he constitutes, whether they are internal or external relations. But positive construction carries with it an insight which is wanting in experiment, be the physical conditions ever so favourable; and thus analysis and synthesis have in mathematics, along with perfect freedom of scope, a determinateness far surpassing anything that is attainable in chemistry.

III. *Psychological Analysis and Synthesis.*—Passing for the next signal application of analysis from the world of matter to mind, we have here a subject which more perhaps than any other calls for an exercise of the process in order to be scientifically understood. Physical things in their superficial relations lie to a great extent open to direct apprehension, and, whatever deeper connexions there may be to be traced out among things the most remote in their nature as apprehended, yet the fact of their separation in space involved in our perception of them is already something done, leaving the scientific function (analytic and synthetic) to be exercised chiefly in the attempt to comprehend them. Very different is the state of affairs in mind, where everything, as it were, runs or melts into everything else. Even to lay hold of particular mental phenomena, with a view to the explanation of them, implies already an express scientific attitude, which must be called analytic.

Particular mental states being supposed to be got, with such definiteness of apprehension (always more or less imperfect) as the subject-matter admits of, the business of the psychologist becomes substantially one with that of the physical inquirer. Accordingly, it is often urged that complex mental states conform to the two types of mechanical and chemical composition, in the sense that some are to be resolved after the manner of complex phenomena of motion, and others by a process analogous to that employed in chemistry for the qualities of concrete substances. The analogy, however, especially in the second class of states, is decidedly loose. Psychological phenomena of cognition or emotion, held to be developed, under general mental laws, out of simpler states of sense, resemble chemical compounds only in having a character unlike that of any of the elements that go to make them; in particular, they do not admit of that actual resolution into their elements which lends so much evidence to the processes of chemistry. The realm of nature supplies a far apter analogy in the phenomena of organic growth, more especially as mental states do, in fact, stand in direct relation with states of the bodily organism. It is as impossible to make an actual analysis or synthesis of the physiological complex of life as of the psychological complex of mind; and it is only more difficult (the phenomena being undoubtedly more recondite and fluctuating) to practise experiments in psychology than in physiology. But, at all events, there is no new principle involved in the scientific treatment of mind; nor again in the treatment of moral and social questions, for an insight into which psychological knowledge is indispensable.

IV. *Logical Analysis and Synthesis.*—To logic, taken in its widest sense as the methodology of all science, it belongs to appreciate the general import of all such applications of analysis and synthesis as have now been considered. There remains, however, a special variety which is itself entitled logical analysis and synthesis, and which has the more carefully to be distinguished from the other heads, because it stands in an opposition to them all.

Logical analysis is the same process as that which is otherwise called metaphysical division. (The process called logical division is different.) Given, say, a concrete subject like man, this may be divided physically into a number of parts in space, or, as a concept, metaphysically into a number of qualities or attributes,—metaphysically, because none of these has an independent subsistence or physical existence apart. They are distinguished in the way of mental consideration, or, as it is technically called, abstraction; and, this being a thought-process or logical act, the resolution of the given complex into such conceptual elements gets the name also of logical analysis. The corresponding act of synthesis proceeds by the way that is technically called determination; thus the general concept man, to take the traditional example, has the attribute of rational joined to the attributes of animal, or is determined by that addition, and much else has to be added in a similar way before the particular concrete can be determined.

Now it is evident that such analysis and synthesis have an application to any kind of thought that the mind can conceive; and thus logicians, in meaning, as they have commonly done, nothing more by the names, have signalised processes that are in truth of no small account for knowledge in general. There is no kind of scientific inquiry, strictly so called, and whatever be its scope and method, that does not involve at all stages from the first such analysis or abstract mental consideration. Nay, it may be said that science, as opposed to the natural experience of things, or to the artistic interest which centres upon fully bodied-out concretes, is analysis in this present sense, everywhere breaking up to find community of character under the mask of superficial difference, and sifting out the one from the many. But when logicians, not disregarding the various applied methods of the real sciences or consciously excluding them as lying beyond the province of pure logic, would seek to reduce all scientific procedure to this kind of mental action, the attempt implies a deep misapprehension. It is one thing for the mind to have its subject of inquiry clearly and sharply defined apart from what else is given therewith, or again to have its existing knowledge always well in hand and sifted out to the uttermost; it is another thing for the mind to be making advances, to be passing out from the known to the unknown, or labouring to bring the unknown into relation with that which is known already. Condillac is the thinker who has most expressly made the attempt to bring all scientific method back to the conception of mere logical analysis, repeating it everywhere throughout his works. The sixteenth chapter of his unfinished treatise, the *Langue des Calculs*, may especially be noted in this respect;

the more because he there endeavours to justify his developed expression for the procedure of all science—that it consists in a continued substitution of identical propositions—by the actual solution of an algebraical problem. Simple, however, though the instance chosen is, he fails to make good his view, appearing to prove it only by leaving out the step of critical moment.

To analysis and synthesis in the specially logical sense is undoubtedly related the distinction that logicians have made of analytic and synthetic method. Without stepping beyond the bounds of logic conceived as a formal doctrine, a fourth department, under the name of Method or Disposing, may be added to the three departments regularly assigned—Conceiving (Simple Apprehension), Judging, Reasoning; and this would consider how reasonings, when employed continuously upon any matter whatever, should be set forth to produce their combined effect upon the mind. The question is formal, being one of mere exposition, and concerns the teacher in relation to the learner. How should results, attained by continuous reasoning, be set before the mind of a learner? Upon a line representing the course by which they were actually wrought out? Or always in the fixed order of following from express principles to which preliminary assent is required? If the latter, all teaching becomes synthetic, and follows a progressive route from principles to conclusions, even when discovery (supposing discovery foregone) was made by analysis or regression to principles; of which expository method no better illustration could be given than the practice of Euclid in the demonstrations of his *Elements*. On the other hand, it may be said that the line of discovery is itself the line upon which the truth about any question can best be expounded or understood, for the same reason that was found successful in discovery, namely, that the mind (now of the learner) has before it something quite definite and specific to start from; upon which view, the method of exposition should be analytic or regressive to principles, at least wherever the discovery took that route. The blending of both methods, where possible, is doubtless most effective; otherwise it depends upon circumstances—chiefly the character of the learner, but also the nature of the subject in respect of complexity—which should be preferred, when one alone is followed.

The question of prime logical, or general, importance remaining is to determine the relation of Analysis and Synthesis as methods of real science, to the ground-processes of all reasoning, known since the days of Aristotle under the names of Induction and Deduction. Much difference of opinion has been expressed on this subject, not only because of the want of agreement as to what should be called analysis and synthesis, but also because of more fundamental disagreement regarding the nature of the inductive and deductive processes.

It was remarked before as somewhat surprising, that Aristotle himself did not more expressly consider the relation, when we have seen that he was familiar with the process of geometrical analysis, under the very name. The distinction, however, upon which he lays so much stress throughout his works, between knowledge from principles, prior or better known by nature, and knowledge of or from facts, prior in experience or relatively to us, has generally been understood to imply a connexion of synthesis with deduction, of analysis with induction; so much so indeed, that synthetic and deductive method, analytic and inductive method, have come to be used respectively almost as interchangeable terms. Nor, although Sir William Hamilton seems to wish to reverse the usual association of the terms, when he calls induction a purely synthetic process, and declares it to be erroneously viewed as analytic (*Metaphysics*, i. 102), is he really at variance with the other authorities; his observation having a special reference which the others also might allow. But any such association seems to rest upon a misconception, not to be laid to the charge of Aristotle himself. In the sense of analysis and synthesis for which it is important to determine the relation, namely, when they are taken as the means of real discovery in science, the true view rather is that they are the different methods in which reasoning, whether inductive or deductive, must be applied for discovering truth in the form of special or particular questions. Analysis, as well as synthesis, may proceed by way of deduction, as we have seen in the process of mathematics; on the other hand, synthesis as applied in chemistry is as much an inductive act, being strictly experimental, as anything could well be. Induction and deduction are concerned about the relation of the particular and general in thought; analysis and synthesis about the relation of the known and the unknown. The two points of view are of course related to each other: analysis and synthesis, as practised by the human mind, either for purposes of science or in the affairs of life, cannot be worked except under those highest laws of the relation between the particular and general in thought which Aristotle's genius first was able to extract from the instinctive practice of human reason. But whether the processes are applied singly, or, for greater assurance, conjointly, it depends upon the matter of the inquiry under which laws—those of induction or those of deduction—they shall be worked; and in any case there is implied a peculiar intellectual attitude different from that of mere formal reasoning. It is the difference between the act of finding out and proving. If it should ever become possible to develop a logic of Discovery, it must consist in the formulation of the processes of Analysis and Synthesis, conceived in the general sense attributed to them in the foregoing article.

ANALYTIC JUDGMENTS.[1]

ANALYTIC JUDGMENTS have been distinguished under that name, in opposition to Synthetic, since the time of Kant. It was necessary, for the purposes of his critical inquiry into the principles of human knowledge, that he should carefully determine the character of those assertions which metaphysicians had so freely made respecting the supernatural, and he found them to be such that, while the predicate was added on to the subject, not involved in it, the connexion was affirmed as necessary and universal. He therefore called them, as well as other assertions of like character in mathematics and pure physics, synthetic judgments *a priori*, and the aim of his critical inquiry came to be the determining of the conditions under which such judgments were possible. Now, as differing from these, he noted two classes of judgments: (1), such as in the predicate added indeed to the content of the subject, but only empirically, as, for example, Bodies have weight, and these he called synthetic *a posteriori*; (2), such as were indeed necessary and universal, but added nothing to the content of the subject, as, for example, Bodies are extended, and these he called analytic.

The general distinction of analytic and synthetic judgments has a value apart from the specific character of those (synthetic) judgments in which Kant was most interested, and for the sake of which mainly it was fixed by him. Trained in the metaphysics of the Leibnizo-Wolffian school, which marked off necessary judgments from those of simple fact without considering the kinds of necessity, Kant, when he came, by the route that can be traced in his earlier works, to apprehend the difference between merely logical analysis and real synthesis in thought, applied it almost exclusively to those judgments for which a character of necessity was claimed. He therefore noticed traces of the distinction in other thinkers, as Locke, only in so far as there was a suggestion also of this special reference. In truth, the general distinction, under a variety of expressions, was familiar to both Hume and Locke, and it had already been drawn by the ancients. The old doctrine of the Predicables, in distinguishing the essential predication of genus, species, and difference from the non-essential predication of property and accident, plainly involves it; making besides, as between the last two predicables, a distinction which is very closely related to that drawn by Kant between the *a priori* and *a posteriori* synthetic. From the nominalistic point of view it is expressed by the difference of Verbal and Real propositions, as in Mill's *Logic*, and also often in Locke.

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[1] *Encyclopædia Britannica*, 9th ed.

While the synthetic judgment, as the name implies, brings together in thought two distinct concepts, each of which may be thought apart, the analytic judgment is merely the explication of a single concept in the form of a proposition. It is disputed what may be the ground of synthesis in different cases, but on all hands it is agreed that the logical Law of Contradiction is the controlling principle for the explication of concepts already in the mind, however they may have come there. Now the explication may be made either completely or partially, according as the whole or part only of the intension of the concept is set forth: in other words, the aim may be to give the definition (where, in the full sense, that is possible), or simply to express any one or more of the contained attributes. Propositions giving such partial explication are spoken of by Locke as "trifling"; and it is true that, if the concept is supposed already in the mind, no increase of knowledge is thereby obtained. This word, however, is unfortunate. Not to say that it is equally applicable to definitions, where the explication is only more complete, it tends to keep out of view the fact that analytic judgments, when not arbitrarily formed, are themselves—or rather the concepts, of which they are the explications, are—the permanent result or deposit of foregone real synthesis. So much, indeed, is this the case with concepts of things in nature—what Mill calls natural kinds—that in them a constant process of accretion is going on; new attributes, as they are discovered, being taken up into the essence, if they are at the same time characteristic and underived. Much also that is mere explication to one mind is real information to another.

The terms Analytic and Synthetic, thus applied to judgments, are so expressive in themselves that they have now come into general use. It is, however, a serious drawback to such an association of the terms, that it traverses what is otherwise the consistent use of the words analysis and synthesis in relation to each other. As the article ANALYSIS has shown, there is a synthesis which, as much as any analysis, is purely logical, and there is an analysis which, as much as any synthesis, is a means of real advance in knowledge. The terms Explicative (*Erläuterungsurtheile*) and Ampliative (*Erweiterungsurtheile*), also employed by Kant, while not less expressive, are open to no such objection.

ASSOCIATION OF IDEAS.[1]

ASSOCIATION OF IDEAS, or MENTAL ASSOCIATION, is a general name used in psychology to express the conditions under which representations arise in consciousness, and also is the name of a principle of explanation put forward by an important school of thinkers to account generally for the facts of mental life. The more common expression, from the time of Locke, who seems to have first employed it, has been Association of Ideas; but it is allowed or urged on all hands that this phrase contains too narrow a reference; association, in either of the senses above noted, extending beyond ideas or thoughts proper to every class of mental states. In the long and erudite Note D**, appended by Sir W. Hamilton to his edition of *Reid's Works*, and offered as a contribution towards a history of the doctrine of mental suggestion or association, many anticipations of modern statements are cited from the works of ancient or mediæval thinkers, and for Aristotle, in particular, the glory is claimed of having at once originated the doctrine and practically brought it to perfection. Aristotle's enunciation of the doctrine is certainly very remarkable. As translated by Hamilton, but without his interpolations, the classical passage from the tract *De Memoria et Reminiscentia* runs as follows:—

> When, therefore, we accomplish an act of reminiscence, we pass through a certain series of precursive movements, until we arrive at a movement on which the one we are in quest of is habitually consequent. Hence, too, it is that we hunt through the mental train, excogitating from the present or some other, and from similar or contrary or coadjacent. Through this process reminiscence takes place. For the movements are, in these cases, sometimes at the same time, sometimes parts of the same whole, so that the subsequent movement is already more than half accomplished.

The passage is obscure (leaving open to Hamilton to suggest a peculiar interpretation of it, that may be noticed in connexion with the elaborate doctrine of association put forward by himself, as if to evince the shortcomings rather than the perfection of Aristotle's), but it does in any case indicate the various principles commonly termed Contiguity, Similarity, and Contrast; and, though the statement of these cannot be said to be followed up by an effective exposition or application, it quite equals in scope the observations of many a modern inquirer. Zeno the Stoic also, and Epicurus, according to the report of Diogenes Laertius (vii. § 52, x. § 32, overlooked by Hamilton), enumerated similar principles of mental association. By St. Augustin at the end of his long rhapsody on the wonders of memory in book x. of his *Confessions*, it was noted (c. 19) that the mind, when it tries to remember something it knows it has forgotten, has, as it were, hold of part and thence makes quest after the other part. Meanwhile and later, Aristotle's doctrine received a more or less intelligent expansion and illustration from the ancient commentators and the schoolmen; and in the still later period of transition from the age of scholasticism to the time of modern philosophy, prolonged in the works of some writers far into the seventeenth century, Hamilton, from the stores of his learning, is able to adduce not a few philosophical authorities who gave prominence to the general fact of mental association—the Spaniard Ludovicus Vives (1492-1540) especially being most exhaustive in his account of the conditions of memory. This act of justice, however, once rendered to earlier inquirers, it is to modern views of association that attention may fairly be confined.

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[1] *Encyclopædia Britannica*, 9th ed.

In Hobbes's psychology so much importance is assigned to what he called, variously, the succession, sequence, series, consequence, coherence, train, &c., of imaginations or thoughts in mental discourse, that he has not seldom been regarded, by those who did not look farther back, as the founder of the theory of mental association. He did, indeed, vividly conceive and illustrate the principle of Contiguity, but, as Hamilton conclusively shows, he reproduced in his exposition but a part of the Aristotelian doctrine, nor even this without wavering: representing the sequence of images, in such states as dreams, now (in his *Human Nature*) as casual or incoherent, now (in *Leviathan*), following Aristotle, as simply unguided. Not before Hume, among the moderns, is there express question as to a number of distinct principles of association. Locke had, meanwhile, introduced the phrase Association of Ideas as the title of a supplementary chapter incorporated with the fourth edition of his *Essay*, meaning it, however, only as the name of a principle accounting for the mental peculiarities of individuals, with little or no suggestion of its general psychological import. Of this last Hume had the strongest impression, and thinking himself, in forgetfulness or ignorance of Aristotle's doctrine of reminiscence, the first inquirer that had ever attempted to enumerate all the modes of normal association among mental states, he brought them to three—Resemblance, Contiguity in time and place, Cause and (or) Effect. Without professing to arrive at this result otherwise than by an inductive consideration of instances, he yet believed his enumeration to be exhaustive, and sought to prove it so by resolving Contrast—one of Aristotle's heads, commonly received—as a mixture of causation and resemblance. Viewed in relation to his general philosophical position, it must always remain a perplexing feature of Hume's list of principles, that he specified Causation as a principle distinct from Contiguity in time, while otherwise the list has no superiority to Aristotle's. Hume's fellow-countrymen, Gerard and Beattie, in opposition to him, recurred accordingly to the traditional enumeration; and, in like manner, Dugald Stewart put forward Resemblance, Contrariety, and Vicinity in time and place, though he added, as another obvious principle, accidental coincidence in the sounds of Words, and farther noted three other cases of relation, namely, Cause and Effect, Means and End, and Premisses and Conclusion, as holding among the trains of thought under circumstances of special attention. Reid, preceding Stewart, was rather disposed, for his own part, to make light of the subject of association, vaguely remarking that it seems to require no other original quality of mind but the power of habit to explain the spontaneous recurrence of trains of thinking, when become familiar by frequent repetition (*Intellectual Powers,* p. 387). The counter-observation of his editor, Hamilton, that we can as well explain habit by association as association by habit, might with reason have been pointed more sharply.

Hamilton's own theory of mental reproduction, suggestion, or association, given in outline in Note D*** following the historical note before mentioned, at the end of his edition of *Reid's Works*, calls for more special notice, as perhaps the most elaborate expression yet devised for the principles involved in the phenomena of mental representation. It is a development, greatly modified, of the doctrine expounded in his *Lectures on Metaphysics* (vol. ii. p. 223, *seq.*), which, in agreement with some foreign authorities, reduced the principles of association first to two—Simultaneity and Affinity, and these farther to one supreme principle of Redintegration or Totality. In the ultimate scheme he posits no less than four general laws of mental succession concerned in reproduction: (1) Associability or possible co-suggestion (all thoughts of the same mental subjects are associable, or capable of suggesting each other); (2) Repetition or direct remembrance (thoughts coidentical in modification, but differing in time, tend to suggest each other); (3) Redintegration, direct remembrance or reminiscence (thoughts once coidentical in time are, however different as mental modes, again suggestive of each other, and that in the mutual order which they originally held); (4) Preference (thoughts are suggested not merely by force of the general subjective relation subsisting between themselves, they are also suggested in proportion to the relation of interest, from whatever source, in which they stand to the individual mind). Upon these follow, as special laws: A, Primary—modes of the laws of Repetition and Redintegration—(1), law of Similars (Analogy, Affinity); (2), law of Contrast; (3), law of Coadjacency (Cause and Effect, &c.); B, Secondary—modes of the law of Preference, under the law of Possibility—(1), laws of Immediacy and Homogeneity; (2), law of Facility. Such is the scheme; and now may be understood what interpretation Hamilton desires to put upon Aristotle's doctrine, when he finds or seeks in it a parallel relation to that established by himself between the general laws, more especially Redintegration, and his special ones. But, though the commentary of Themistius, which he cites, lends some kind of support to the position, it cannot be maintained without putting the greatest strain on Aristotle's language, and in one place it is as good as surrendered by Hamilton himself (footnote, p. 900, *b*). Nor is the ascription of such a meaning at all necessary to establish Aristotle's credit as regards the doctrine of mental association.

Thus far the principles of association have been considered only as involved in mental reproduction and representation. There has grown up, however, especially in England, the psychological school above mentioned, which aims at explaining all mental acquisitions, and the more complex mental processes generally, under laws not other than those determining simple reproduction. Hamilton also, though professing, in the title of his outline just noticed, to deal with reproduction only, formulates a number of still more general laws of mental succession—law of Succession, law of Variation, law of Dependence, law of Relativity or Integration (involving law of Conditioned), and, finally, law of Intrinsic or Objective Relativity—as the highest to which human consciousness is subject; but it is in a sense quite different that the psychologists of the so-called Associationist School intend their appropriation of the principle or principles commonly signalised. As far as can be judged from imperfect records, they were anticipated to some extent by the experientialists of ancient times, both Stoic and Epicurean (*cf.* Diogenes Laertius, as above). In the modern period, Hobbes is the first thinker of permanent note to whom the doctrine may be traced. Though he took, as has been seen, anything but an exhaustive view of the phenomena of mental succession, yet, after dealing with trains of imagination, or what he called mental discourse, he sought in the higher departments of intellect to explain reasoning as a discourse in words, dependent upon an arbitrary system of marks, each associated with, or standing for, a variety of imaginations;

and, save for a general assertion that reasoning is a reckoning—otherwise, a compounding and resolving—he had no other account of knowledge to give. The whole emotional side of mind, or, in his language, the passions, he, in like manner, resolved into an expectation of consequences based on past experience of pleasures and pains of sense. Thus, though he made no serious attempt to justify his analysis in detail, he is undoubtedly to be classed with the associationists of the next century—Hartley and the others. They, however, were wont to trace the first beginnings of their psychological theory no farther back than to Locke's *Essay*. If this seems strange, when Locke did little more than supply them with the word Association, it must be remembered in what ill repute the name of Hobbes stood, and also that Locke's work, though not directly concerned with the question of psychological development, being rather of metaphysical or logical import, was eminently psychological in spirit, and might fairly be held to contain in an implicit form the principle or principles evolved later by the associationists. Berkeley, dealing, immediately after Locke and altogether in Locke's spirit, with the special psychological problem of visual perception, was driven to posit expressly a principle of suggestion or association in these terms: "That one idea may suggest another to the mind, it will suffice that they have been observed to go together, without any demonstration of the necessity of their coexistence, or so much as knowing what it is that makes them so to coexist" (*New Theory of Vision*, § 25); and to support the obvious application of the principle to the case of the sensations of sight and touch before him, he constantly urged that association of sound and sense of language which the later school has always put in the foreground, whether as illustrating the principle in general or in explanation of the supreme importance of language for knowledge. It was natural, then, that Hume, coming after Berkeley, and assuming Berkeley's results, though he reverted to the larger inquiry of Locke, should be more explicit in his reference to association; and, not only explicit, he was original also, when he spoke of it as a "kind of attraction which in the mental world will be found to have as extraordinary effects as in the natural, and to show itself in as many and as various forms" (*Human Nature*, i. 1, § 4). Other inquirers were, in fact, appearing about the same time, who conceived of association with this breadth of view, and set themselves to track, as psychologists, its effect in detail.

Hartley's *Observations on Man*, published in 1749 (eleven years after the *Human Nature*, and one year after the better-known *Inquiry*, of Hume), opened the path for all the investigations of like nature that have since that time become so characteristic of the English name in psychology. According to his own statement, his attention was first turned to the subject about eighteen years before, through what he heard of an opinion of the "Rev. Mr. Gay," that it was possible to deduce all our intellectual pleasures and pains from association. Gay is known only by a dissertation on the fundamental principles of virtue, prefixed, at first anonymously, in 1731, to Archdeacon (afterwards Bishop) Law's translation of King's *Origin of Evil*, wherein it was maintained, with considerable force, that by association the feelings belonging to ends may come to attach themselves to means, and give rise to action for the means as if they were ends, as seen (the instance has become a commonplace) in the passion for money-making. In this vein, but on a very different scale, Hartley proceeded to work. A physician by profession, and otherwise well versed in science, he sought to combine with an elaborate theory of mental association a minutely detailed hypothesis as to the corresponding action of the nervous system, based upon the suggestion of a vibratory motion within the nerves thrown out by Newton in the last paragraph of the *Principia*. So far, however, from promoting the acceptance of the psychological theory, this physical hypothesis proved to have rather the opposite effect, and it began to be dropped by Hartley's followers (as Priestley, in his abridged edition of the *Observations*, 1775) before it was seriously impugned from without. When it is studied in the original, and not taken upon the report of hostile critics, who would not, or could not—at all events, who did not—understand it, no little importance must still be accorded to the first attempt, not seldom a curiously felicitous one, to carry through that parallelism of the physical and psychical which since then has come to count for more and more in the science of mind. Nor should it be forgotten that Hartley himself, for all his paternal interest in the doctrine of vibrations, was careful to keep separate from its fortunes the cause of his other doctrine of mental association. Of this the point lay in no mere restatement, with new precision, of a principle of coherence among "ideas," but in its being taken as a clue by which to follow the progressive development of the mind's powers. Holding that mental states could be scientifically understood only as they were analysed, Hartley sought for a principle of synthesis to explain the complexity exhibited not only in trains of representative images, but alike in the most involved combinations of reasonings and (as Berkeley had seen) in the apparently simple phenomena of objective perception, as well as in the varied play of the emotions, or, again, in the manifold conscious adjustments of the motor system. One principle appeared to him sufficient for all, running, as enunciated for the simplest case, thus: "Any sensations A, B, C, &c., by being associated with one another a sufficient number of times, get such a power over the corresponding ideas (called by Hartley also vestiges, types, images) *a*, *b*, *c*, &c., that any one of the sensations A, when impressed alone, shall be able to excite in the mind *b*, *c*, &c., the ideas of the rest". To render the principle applicable in the cases where the associated elements are neither sensations nor simple ideas of sensations, Hartley's first care was to determine the conditions under which states other than these simplest ones have their rise in the mind, becoming the matter of ever higher and higher combinations. The principle itself supplied the key to the difficulty, when coupled with the notion, already implied in Berkeley's investigations, of a coalescence of simple ideas of sensation into one complex idea, which may cease to bear any obvious relation to its constituents. So far from being content, like Hobbes, to make a rough generalisation to all mind from the phenomena of developed memory, as if these might be straightway assumed, Hartley made a point of referring them, in a subordinate place of their own, to his universal principle of mental synthesis. He expressly put forward the law of association, endued with such scope, as supplying what was wanting to Locke's doctrine in its more strictly psychological aspect, and thus marks by his work a distinct advance on the line of development of the experiential philosophy.

The new doctrine received warm support from some, as Law and Priestley, who both, like Hume and Hartley himself, took the principle of association as having the like import for the science of mind that gravitation had acquired for the science of matter. The principle began also, if not always with direct reference to Hartley, yet, doubtless, owing to his impressive advocacy of it, to be applied systematically in special directions, as by Tucker (1768) to morals, and by Alison (1790) to æsthetics. Thomas Brown (d. 1820) subjected anew to discussion the question of theory. Hardly less unjust to Hartley than Reid or Stewart had been, and forward to proclaim all that was different in his own position, Brown must yet be ranked with the associationists before and after him for the prominence he assigned to the associative principle in sense-perception (what he called external affections of mind), and for his reference of all other mental states (internal affections) to the two generic capacities or susceptibilities of Simple and Relative Suggestion. He preferred the word Suggestion to Association, which seemed to him to imply some prior connecting process, whereof there was no evidence in many of the most important cases of suggestion, nor even, strictly speaking, in the case of contiguity in time where the term seemed least inapplicable. According to him, all that could be assumed was a general constitutional tendency of the mind to exist successively in states that have certain relations to each other, of itself only, and without any external cause or any influence previous to that operating at the moment of the suggestion. Brown's chief contribution to the general doctrine of mental association, besides what he did for the theory of perception, was, perhaps, his analysis of voluntary reminiscence and constructive imagination—faculties that appear at first sight to lie altogether beyond the explanatory range of the principle. In James Mill's *Analysis of the Phenomena of the Human Mind* (1829), the principle, much as Hartley had conceived it, was carried out, with characteristic consequence, over the psychological field. With a much enlarged and more varied conception of association, Prof. Bain has re-executed the general psychological task in the present generation, while Mr. Herbert Spencer has revised the doctrine from the new point of view of the evolution-hypothesis. John Stuart Mill made only occasional excursions into the region of psychology proper, but sought, in his *System of Logic* (1843), to determine the conditions of objective truth from the point of view of the associationist theory, and, thus or otherwise being drawn into general philosophical discussion, spread wider than any one before him its repute.

It is remarkable that the Associationist School has been composed chiefly of British thinkers, but in France also it has had distinguished representatives. Of these it will suffice to mention Condillac, the author of the sensationalist movement in the eighteenth century, who professed to explain all knowledge from the single principle of association (*liaison*) of ideas, operating through a previous association with signs, verbal or other. At the present day the later English school counts important adherents among the younger French thinkers. In Germany, before the time of Kant, mental association was generally treated in the traditional manner, as by Wolff. Kant's inquiry into the foundations of knowledge, agreeing in its general purport with Locke's, however it differed in its critical procedure, brought him face to face with the newer doctrine that had been grafted on Locke's philosophy; and to account for the fact of synthesis in cognition, in express opposition to associationism, as represented by Hume, was, in truth, his prime object, starting, as he did, from the assumption that there was that in knowledge which no mere association of experiences could explain. To the extent, therefore, that his influence prevailed, all such inquiries as the English associationists went on to prosecute were discounted in Germany. Notwithstanding, under the very shadow of his authority a corresponding, if not related, movement was initiated by Herbart. Peculiar, and widely different from anything conceived by the associationists, as Herbart's metaphysical opinions were, he was at one with them, and at variance with Kant, in assigning fundamental importance to the psychological investigation of the development of consciousness, nor was his conception of the laws determining the interaction and flow of mental presentations and representations, when taken in its bare psychological import, essentially different from theirs. In Beneke's psychology also, and in more recent inquiries conducted mainly by physiologists, mental association has been understood in its wider scope, as a general principle of explanation.

Associationists differ not a little among themselves in the statement of their principle, or, when they adduce several principles, in their conception of the relative importance of these. Hartley took account only of Contiguity, or the repetition of impressions synchronous or immediately successive; and the like is true of James Mill, though, incidentally, he made an express attempt to resolve the received principle of Similarity, and through this the other principle of Contrast, into his fundamental law—law of Frequency, as he sometimes called it, because upon frequency, in conjunction with vividness of impressions, the strength of association, in his view, depended. In a sense of his own, Brown also, while accepting the common Aristotelian enumeration of principles, inclined to the opinion that "all suggestion may be found to depend on prior coexistence, or at least on such proximity as is itself very probably a modification of coexistence," provided account be taken of "the influence of emotions and other feelings that are very different from ideas, as when an analogous object suggests an analogous object by the influence of an emotion which each separately may have produced before, and which is, therefore, common to both". (Upon which view it obviously occurs to remark, that, except in the particular case, plainly not intended, where the objects are experienced in actual succession with the emotion common to both, a suggestion through *similar* emotions must still be presumed.) To the contrary effect, Mr. Spencer maintains that the fundamental law of all mental association is that presentations aggregate or cohere with their like in past experience, and that, besides this law, there is in strictness no other, all further phenomena of association being incidental. Thus in particular, he would explain association by Contiguity as due to the circumstance of imperfect assimilation of the present to the past in consciousness; a presentation in as far as it is distinctly cognised is in fact recognised through cohering with its like in past experience, but there is always, in consequence of the imperfection of our perceptions, a certain range within which the classing of the present experience with past is doubtful—a certain cluster of relations nearly like the one perceived, which become nascent in consciousness in the act of assimilation; now contiguity is likeness of relation in time or in space, or in both, and, when the classing, which, as long as it is general, goes easily and infallibly forward, becomes specific, a presentation may well arouse the merely contiguous, instead of the identical, from former experience. Midway between these opposed views should be noted, finally, the position of Prof. Bain, who regards Contiguity and Similarity, logically, as perfectly distinct principles, though in actual psychological occurrence they blend intimately with each other; contiguous trains being started by a first (it may be implicit) representation through Similarity, while the express assimilation of present to past in consciousness is always, or tends to be, followed by the revival of what was presented in contiguity with that past.

That Similarity is an ultimate ground of mental association cannot seriously be questioned, and to neglect or discount it, in the manner of the older representatives of the school, is to render the associationist theory quite inadequate for purposes of general psychological explanation. It is simply impossible to over-rate the importance of the principle, and, when Mr. Spencer, by way of supporting his position, maintains farther, that the psychological fact of conscious assimilation corresponds with the fundamentally simple physiological fact of re-excitation of the same nervous structures, the force as well as pertinence of the observation is at once evident. Nevertheless, it is one question whether a representation, upon a particular occasion, shall be evoked by Similarity, and another question what shall be raised into consciousness along with it; nor for this is there any help but in positing a distinct principle of Contiguity. The phenomena of presentative cognition or objective perception on which Mr. Spencer bases his argument, are precisely those in which the function of Contiguity is least explicitly manifested, but only because of the certainty and fixity it has assumed through the great uniformity and frequency of such experience. Let the series of presentative elements, as in formal education, be less constant in composition, and less frequently recurrent, than are those aggregates of sensible impressions that, in the natural course of experience, become to us objects in space with a character comparatively fixed, and then the function of Contiguity starts out with sufficient prominence, being found as often as not to fail in determining a revival of the corresponding representative series. All the phenomena, too, of coalescence, in which a variety of elements become fused to a result in consciousness as heterogeneous as any chemical compound in relation to its constituents—phenomena that have remained the very property of the Associationist School since they first were distinctly noted by Hartley—how are these to be explained by the principle of Similarity? Involved as it incontestably is in every repeated apprehension, whether of the elements, or of the product, or of the relation between them, Similarity of itself is powerless to determine a relation the essence of which lies not more in the heterogeneous character of the result than in the diversity of the elements brought together. Nor, in order to support the claim of the principle of Contiguity to an equally fundamental position with that of Similarity, is it more difficult to find an expression in terms of physiology corresponding with the subjective process. The fact that different nerve-centres are excited together, synchronously or successively, along definite lines of connexion, will leave them, being so connected, in a state of relative instability, which, other things equal, will vary in proportion to the frequency and strength of the excitation; and thus, when one of them is, in whatever way, again aroused, the rest will tend to be re-affected also by reason of the instability that has remained. The process of psychological representation, running parallel with the nervous events here supposed, involves assimilation at every stage from and including the first; it is also constantly happening, in contiguous trains, that a break occurs at a particular stage through an express suggestion, by Similarity, of something foreign to the train. But in the one case, as in the other—alike coincident with the implicit action of Similarity, and in the pauses of express assimilation—the principle of Contiguity has a part to play, not to be denied or confounded with any other.

A minor question, also disputed, is whether, by the side of Contiguity and Similarity, Contrast should be held, as by Aristotle, an independent principle of association. That things contrasted may and do often suggest each other in consciousness is on all hands allowed, but ever since Hume attempted, however infelicitously, to resolve the principle into others, its independence has not ceased to lie under suspicion. When the question is approached without prejudice, it cannot but appear strange that mental states which suggest each other because of likeness, should suggest each other because of unlikeness also. In that case anything might suggest everything else, since like and unlike conscious states are all that are possible; nay, unlike states alone are all, as there must always be some difference between any two. Now it is true, in one sense, that anything may suggest anything be it ever so unlike, namely, if the things have been once or repeatedly experienced in conjunction; but then the bond of association is the contiguity, and not the unlikeness, which obviously cannot be a ground for suggesting this one other thing more than any other thing. By contrast, however, is not generally meant bare unlikeness. Genuine contrasts, as black-white, giant-dwarf, up-down, are peculiar in having under the difference a foundation of similarity, the two members lying within the sphere of a common higher notion, and only being distinguished the more impressively by reason of the accompanying unlikeness. Clearly, in the case of mutual suggestion, if it be not the similarity itself that is here the ground of association, it may again be Contiguity, the sharpest experience of each member of the contrast having been when there was experience also of the other; or both grounds may conspire towards the result, the association being then what Prof. Bain has marked as Compound. On the whole, it must be concluded that only in a secondary sense can Contrast be admitted as a principle of mental association.

The highest philosophical interest, as distinguished from that which is more strictly psychological, attaches to the mode of mental association called Inseparable. The coalescence of mental states noted by Hartley, as it had been assumed by Berkeley, was farther formulated by James Mill in these terms:—

> Some ideas are by frequency and strength of association so closely combined that they cannot be separated; if one exists, the other exists along with it in spite of whatever effort we make to disjoin them. (*Analysis of the Human Mind*, 2nd ed. vol. i. p. 93.)

J. S. Mill's statement is more guarded and particular:—

> When two phenomena have been very often experienced in conjunction, and have not, in any single instance, occurred separately either in experience or in thought, there is produced between them what has been called inseparable, or, less correctly, indissoluble, association; by which is not meant that the association must inevitably last to the end of life—that no subsequent experience or process of thought can possibly avail to dissolve it; but only that as long as no such experience or process of thought has taken place, the association is irresistible; it is impossible for us to think the one thing disjoined from the other. (*Examination of Hamilton's Philosophy*, 2nd ed. p. 191.)

Even this statement, however, is somewhat lacking in precision, since there never is any impossibility of thinking the things apart, in the sense of considering them as logically distinct; the very fact of association implies at least such distinctness, while there may be evident, besides, a positive difference of psychological origin, as when, in the case of visual extension, the colour of the field is referred to the passive sensibility of the eye, and the expanse to its mobility. The impossibility is of representation apart, not of logical consideration or thought. It is chiefly by J. S. Mill that the philosophical application of the principle has been made. The first and most obvious application is to so-called necessary truths—such, namely, as are not merely analytic judgments but involve a synthesis of distinct notions. Again, the same thinker has sought, in the work just cited, to prove Inseparable Association the ground of belief in an external objective world. The former application, especially, is facilitated, when the experience through which the association is supposed to be constituted is understood as cumulative in the race, and transmissible as original endowment to individuals—endowment that may be expressed either, subjectively, as latent intelligence, or, objectively, as fixed nervous connexions. Mr. Spencer, as before suggested, is the author of this extended view of mental association.

For a detailed exposition of the psychological theory of the Associationist School, the reader is referred to the works of its latest representatives named above. The question is still under discussion, how far the theory avails to account for the facts of intelligence, not to say the complex phases of mental life in general in all their variety; nor, were the theory carried out farther than it has yet been by any one, and formulated in terms commanding more general assent than any expression of it has yet obtained even from professed adherents, is it likely to be raised above dispute. Yet it must be allowed to stand forward with a special claim to the scientific character; as already in his time Laplace (who, though an outsider, could well judge) bore witness, when, speaking of the principle of association (Contiguity) as applied to the explanation of knowledge, he declared it *la partie réelle de la métaphysique* (*Essai phil. sur les Probabilités, Œuvres*, vol. vii. p. cxxxvii.). If in the physical sciences the object of the inquirer is confined to establishing laws expressive of the relations subsisting amongst phenomena, then, however different be the internal world of mind—however short such treatment may seem to come of expressing the depth and fulness even of its phenomenal nature—a corresponding object is as much as the scientific psychologist can well set to himself. The laws of association express undoubted relations holding among particular mental states, that are the real or actual facts with which the psychologist has to deal, and it becomes a strictly scientific task to inquire how far the whole complexity of the internal life may receive an explanation therefrom. Understood in this sense, Hume's likening of the laws of mental association to the principle of gravitation in external nature is perfectly justifiable. It is to the credit of the associationists to have grasped early, and steadily maintained, such a conception of psychological inquiry, and, whatever their defects of execution may have been or remain, their work retains a permanent value as a serious attempt to get beyond barren description of abstract mental faculties to real and effective explanation. The psychologists that, in the related point of view, have earned the title of the Analytical School, from holding before their eyes the exemplar of the method of the positive sciences, are precisely those that have fastened upon the principles of association as the ground of mental synthesis; and, till it is shown that the whole method of procedure is inapplicable to such a subject as mind, their conception is entitled to rank as a truly scientific one.

AXIOM.[1]

Axiom, from the Greek *ἀξίωμα,* is a word of great import both in general philosophy and in special science; it also has passed into the language of common life, being applied to any assertion of the truth of which the speaker happens to have a strong conviction, or which is put forward as beyond question. The scientific use of the word is most familiar in mathematics, where it is customary to lay down, under the name of axioms, a number of propositions of which no proof is given or considered necessary, though the reason for such procedure may not be the same in every case, and in the same case may be variously understood by different minds. Thus scientific axioms, mathematical or other, are sometimes held to carry with them an inherent authority or to be self-evident, wherein it is, strictly speaking, implied that they cannot be made the subject of formal proof; sometimes they are held to admit of proof, but not within the particular science in which they are advanced as principles; while, again, sometimes the name of axiom is given to propositions that admit of proof within the science, but so evidently that they may be straightway assumed. Axioms that are genuine principles, though raised above discussion within the science, are not therefore raised above discussion altogether. From the time of Aristotle it has been claimed for general or first philosophy to deal with the principles of special science, and hence have arisen the questions concerning the nature and origin of axioms so much debated among the philosophic schools. Besides, the general philosopher himself, having to treat of human knowledge and its conditions as his particular subject-matter, is called to determine the principles of certitude, which, as there can be none higher, must have in a peculiar sense that character of ultimate authority (however explicable) that is ascribed to axioms; and by this name, accordingly, such highest principles of knowledge have long been called. In the case of a word so variously employed there is, perhaps, no better way of understanding its proper signification than by considering it first in the historical light—not to say that there hangs about the origin and early use of the name an obscurity which it is of importance to dispel.

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[1] *Encyclopædia Britannica*, 9th ed.

The earliest use of the word in a logical sense appears in the works of Aristotle, though, as will presently be shown, it had probably acquired such a meaning before his time, and only received from him a more exact determination. In his theory of demonstration, set forth in the *Posterior Analytics*, he gives the name of axiom to that immediate principle of syllogistic reasoning which a learner must bring with him (i. 2, 6); again, axioms are said to be the common principles from which all demonstration takes place—common to all demonstrative sciences, but varying in expression according to the subject-matter of each (i. 10, 4). The principle of all other axioms—the surest of all principles—is that called later the principle of Contradiction, indemonstrable itself, and thus fitted to be the ground of all demonstration (*Metaph.*, iii. 2, iv. 3). Aristotle's followers, and, later on, the commentators, with glosses of their own, repeat his statements. Thus, according to Themistius (*ad Post. Anal.*), two species of axioms were distinguished by Theophrastus—one species holding of all things absolutely, as the principle (later known by the name) of Excluded Middle, the other of all things of the same kind, as that the remainders of equals are equal. These, adds Themistius himself, are, as it were, connate and common to all, and hence their name Axiom; "for what is put over either all things absolutely or things of one sort universally, we consider to have precedence with respect to them". The same view of the origin of the name reappears in Boethius's Latin substitutes for it—*dignitas* and *maxima* (*propositio*), the latter preserved in the word Maxim, which is often used interchangeably with Axiom. In Aristotle, however, there is no suggestion of such a meaning. As the verb ἀξιοῦν changes its original meaning of *deem worthy* into *think fit*, *think* simply, and also *claim* or *require*, it might as well be maintained that ἀξίωμα—which Aristotle himself employs in its original ethical sense of *worth*, also in the secondary senses of *opinion* or *dictum* (*Metaph.*, iii. 4), and of simple *proposition* (*Topics*, viii. 1)—was conferred upon the highest principles of reasoning and science because the teacher might require them to be granted by the learner. In point of fact, later writers, like Proclus and others quoted by him, did attach to Axiom this particular meaning, bringing it into relation with Postulate (αἴτημα), as defined by Aristotle in the *Posterior Analytics*, or as understood by Euclid in his *Elements*. It may here be added that the word was used regularly in the sense of bare *proposition* by the Stoics (Diog. Laert., vii. 65, though Simplicius curiously asserts the contrary, *ad Epict. Ench.*, c. 58), herein followed in the later times by the Ramist logicians, and also, in effect, by Bacon.

That Aristotle did not originate the use of the term axiom in the sense of scientific first principle, is the natural conclusion to be drawn from the reference he makes to "what are called axioms in mathematics" (*Metaph.*, iv. 3). Sir William Hamilton (Note A, *Reid's Works*, p. 765) would have it that the reference is to mathematical works of his own now lost, but there is no real ground for such a supposition. True though it be, as Hamilton urges, that the so-called axioms standing at the head of Euclid's *Elements* acquired the name through the influence of the Aristotelian philosophy, evidence is not wanting that by the time of Aristotle, a generation or more before Euclid, it was already the habit of geometricians to give definite expression to certain fixed principles as the basis of their science. Aristotle himself is the authority for this assertion, when, in his treatise *De Cœlo*, iii. 4, he speaks of the advantages of having definite principles of demonstration, and these as few as possible, such as are postulated by mathematicians (καθάπερ ἀξιοῦσι καὶ οἱ ἐν τοῖς μαθήμασιν), who always have their principles limited in kind or number. The passage is decisive on the point of general mathematical usage, and so distinctly suggests the very word axiom in the sense of a principle assumed or postulated, that Aristotle's repeated instance of what he himself calls by the name—If equals be taken from equals, the remainders are equal—can hardly be regarded otherwise than as a citation from recognised mathematical treatises. The conclusion, if warranted, is of no small interest, in view of the famous list of principles set out by Euclid, which has come to be regarded in modern times as the typical specimen of axiomatic foundation for a science.

Euclid, giving systematic form to the elements of geometrical science in the generation after the death of Aristotle, propounded, at the beginning of his treatise, under the name of *ὅροι*, the definitions with which modern readers are familiar; under the name of *αἰτήματα*, the three principles of construction now called postulates, together with the three theoretic principles, specially geometrical, now printed as the tenth, the eleventh, and twelfth axioms; finally, under the name of *κοιναὶ ἔννοιαι*, or common notions, the series of general assertions concerning equality and inequality, having an application to discrete as well as continuous quantity, now printed as the first nine axioms. Now, throughout the *Elements*, there are numerous indications that Euclid could not have been acquainted with the logical doctrines of Aristotle: a most important one has been signalised in the article ANALYSIS, and, in general, it may suffice to point out that Euclid, who is said to have flourished at Alexandria from 323 (the year of Aristotle's death) to 283 B.C., lived too early to be affected by Aristotle's work—all the more that he was, by philosophical profession, a Platonist. Yet, although Euclid's disposition of geometrical principles at the beginning of his *Elements* is itself one among the signs of his ignorance of Aristotle's logic, it would seem that he had in view a distinction between his postulates and common notions not unlike the Aristotelian distinction between *αἰτήματα* and *ἀξιώματα*. All the postulates of Euclid (including the last three so-called axioms) may be brought under Aristotle's description of *αἰτήματα*—principles concerning which the learner has, to begin with, neither belief nor disbelief (*Post. Anal.*, i. 10, 6); being (as De Morgan interprets Euclid's meaning) such as the "reader must grant or seek another system, whatever be his opinion as to the propriety of the assumption". Still closer to the Aristotelian conception of axioms come Euclid's common notions, as principles "which there is no question every one will grant" (De Morgan). From this point of view, the composition of Euclid's two lists, as they originally stood, becomes intelligible: be this, however, as it may, there is evidence that his enumeration and division of principles were very early subjected to criticism by his followers with more or less reference to Aristotle's doctrine. Apollonius (250-220 B.C.) is mentioned by Proclus (*Com. in Eucl.*, iii.) as having sought to give demonstrations of the common notions under the name of axioms. Further, according to Proclus, Geminus made the distinction between postulates and axioms which has become the familiar one, that they are indemonstrable principles of construction and demonstration respectively. Proclus himself (412-485 A.D.) practically comes to rest in this distinction, and accordingly extrudes from the list of postulates all but the three received in modern times. The list of axioms he reduces to five, striking out as derivative the two that assert inequality (4th and 5th), also the two that assert equality between the doubles and halves of the same respectively (6th and 7th). Euclid's postulate regarding the equality of right angles and the other assumed in the doctrine of parallel lines, now printed as the 11th and 12th axioms, he holds to be demonstrable: the 10th axiom (regarded as an axiom, not a postulate, by some ancient authorities, and so cited by Proclus himself)—Two straight lines cannot enclose a space—he refuses to print with the others, as being a special principle of geometry. Thus he restricts the name axiom to such principles of demonstration as are common to the science of quantity generally. These, he then declares, are principles immediate and self-manifest—untaught anticipations whose truth is darkened rather than cleared by attempts to demonstrate them.

The question as to the axiomatic principles, whether of knowledge in general or of special science, remained where it had thus been left by the ancients till modern times, when new advances began to be made in positive scientific inquiry and a new philosophy took the place of the peripatetic system, as it had been continued through the Middle Ages. It was characteristic alike of the philosophic and of the various scientific movements begun by Descartes, to be guided by a consideration of mathematical method —that method which had led in ancient times to special conclusions of exceptional certainty, and which showed itself, as soon as it was seriously taken up again, more fruitful than ever in new results. To establish philosophical and all special truth after the model of mathematics became the direct object of the new school of thought and inquiry, and the first step thither consisted in positing principles of immediate certainty whence deductions might proceed. Descartes accordingly devised his criterion of perfect clearness and distinctness of thought for the determination of ultimate objective truth, and his followers, if not himself, adopted the ancient word axiom for the principles which, with the help of the criterion, they proceeded freely to excogitate. About the same time the authority of all general principles began to be considered more explicitly in the light of their origin. Not that ever such consideration had been wholly overlooked, for, on the contrary, Aristotle, in pronouncing the principles of demonstration to be themselves indemonstrable, had suggested, however obscurely, a theory of their development, and his followers, having obscure sayings to interpret, had been left free to take different sides on the question; but, as undoubtedly the philosophic investigation of knowledge has in the modern period become more and more an inquiry into its genesis, it was inevitable that principles claiming to be axiomatic should have their pretensions scanned from this point of view with closer vision than ever before. Locke it was who, when the Cartesian movement was well advanced, more especially gave this direction to modern philosophic thought, turning attention in particular upon the characters of axioms; nor was his original impulse weakened—rather it was greatly strengthened—by his followers' substitution of positive psychological research for his method of general criticism. The expressly critical inquiry undertaken by Kant, at however different a level, had a like bearing on the question as to the nature of axiomatic principles; and thus it has come to pass that the chief philosophic interest now attached to them turns upon the point whether or not they have their origin in experience.

It is maintained, on the one hand, that axioms like other general propositions result from an elaboration of particular experiences, and that, if they possess an exceptional certainty, the ground of this is to be sought in the character of the experiences, as that they are exceptionally simple, frequent, and uniform. On the other hand, it is held that the special certainty, amounting, as it does, to positive necessity, is what no experience, under any circumstances, can explain, but is conditioned by the nature of human reason. More it is hardly possible to assert generally concerning the position of the rival schools of thought, for on each side the representative thinkers differ greatly in the details of their explanation, and there is, moreover, on both sides much difference of opinion as to the scope of the question. Thus Kant would limit the application of the name axiom to principles of mathematical science, denying that in philosophy (whether metaphysical or natural), which works with discursive concepts, not with intuitions, there can be any principles immediately certain; and, as a matter of fact, it is to mathematical principles only that the name is universally accorded in the language of special science—not generally, in spite of Newton's lead, to the laws of motion, and hardly ever to scientific principles of more special range like the atomic theory. Other thinkers, however, notably Leibniz, lay stress on the ultimate principles of all thinking as the only true axioms, and would contend for the possibility of reducing to these (with the help of definitions) the special principles of mathematics, commonly allowed to pass and do duty as axiomatic. Still others apply the name equally and in the same sense to the general principles of thought and to some principles of special science. In view of such differences of opinion as to the actual matter in question, it is not to be expected that there should be agreement as to the marks characteristic of axioms, nor surprising that agreement, where it appears to exist, should often be only verbal. The character of necessity, for example, so much relied upon for excluding the possibility of an experiential origin, may either, as by Kant, be carefully limited to that which can be claimed for propositions that are at the same time synthetic, or may be vaguely taken (as too frequently by Leibniz) to cover necessity of mere logical implication—the necessity of analytic, including identical, propositions—which Kant allowed to be quite consistent with origin in experience. The question being so perplexed, no other course seems open than to try to determine the nature of axioms mainly upon such instances as are, at least practically, admitted by all, and these are mathematical principles.

That propositions with an exceptional character of certainty are assumed in mathematical science, is notorious; that such propositions must be assumed as principles of the science, if it is to be at once general and demonstrative, is now conceded even by extreme experientialists; while it is, further, universally held that it is the exceptional character of the subject-matter of mathematics that renders possible such determinate assumptions. What the actual principles to be assumed are, has, indeed, always been more or less disputed; but this is a point of secondary importance, since it is possible from different sets of assumptions to arrive at results practically the same. The particular list of propositions passing current in modern times as Euclid's axioms, like his original list of common notions, is open to objection, not so much for mixing up assertions not equally underivative (as the ancient critics remarked), but for including two—the 8th and 9th—which are unlike all the others in being mere definitions (*viz.*, of equals and of whole or part). Being intended as a body of principles of geometry in particular within the general science of mathematics, the modern list is not open to exception in that it adds to the propositions of general mathematical import, forming Euclid's original list, others specially geometrical, provided the additions made are sufficient for the purpose. It does, in any case, contain what may be taken as good representative instances of mathematical axioms both general and special; for example, the 1st, Things equal to the same are equal to one another, applicable to all quantity; and the 10th, Two straight lines cannot enclose a space, specially geometrical.

(The latter has been regarded by some writers as either a mere definition of straight lines, or as contained by direct implication in the definition; but incorrectly. If it is held to be a definition, nothing is too complex to be so called, and the very meaning of a definition as a principle of science is abandoned; while, if it is held to be a logical implication of the definition, the whole science of geometry may as well be pronounced a congeries of analytic propositions. When straight line is strictly defined, the assertion is clearly seen to be synthetic.) Now of such propositions as the two just quoted it is commonly said that they are self-evident, that they are seen to be true as soon as stated, that their opposites are inconceivable; and the expressions are not too strong as descriptive of the peculiar certainty pertaining to them. Nothing, however, is thereby settled as to the ground of the certainty, which is the real point in dispute between the experiential and rational schools, as these have become determinately opposed since the time and mainly through the influence of Kant. Such axioms, according to Kant, being necessary as well as synthetic, cannot be got from experience, but depend on the nature of the knowing faculty; being immediately synthetic, they are not thought discursively but apprehended by way of direct intuition. According to the experientialists, as represented by J. S. Mill, they are, for all their certainty, inductive generalisations from particular experiences; only the experiences are peculiar (as already said) in being extremely simple and uniform, while the experience of space—Mill does not urge the like point as regards number—is farther to be distinguished from common physical experience in that it supplies matter for induction no less in the imaginative (representative) than in the presentative form. Mill thus agrees with Kant on a vital point in holding the axioms to be synthetic propositions, but takes little or no account of that which, in Kant's eyes, is their distinctive characteristic—their validity as universal truths in the guise of direct intuitions or singular acts of perception, presentative or representative. The synthesis of subject and predicate, thus universally valid though immediately effected, Kant explains by supposing the singular presentation or representation to be wholly determined from within through the mind's spontaneous act, instead of being received as sensible experience from without; to speak more precisely, he refers the apprehension of quantity, whether continuous or discrete, to "productive imagination," and regards it always as a pure mental construction. Mill, who supposes all experience alike to be passively received, or, at all events, makes no distinction in point of original apprehension between quantity and physical qualities, fails to explain what must be allowed as the specific character of mathematical axioms. Our conviction of their truth cannot be said to depend upon the amount of supporting experience, for increased experience (which is all that Mill secures and secures only for figured magnitude, without psychological reason given) does not make it stronger; and, if they are conceded on being merely stated, which, unless they are held to be analytic propositions, amounts to their being granted upon direct inspection of a particular case, it can be only because the case, so decisive, is made and not found—is constituted or constructed by ourselves, as Kant maintains, with the guarantee for uniformity and adequacy which direct construction alone gives. Still it does not therefore follow that the construction whereby synthesis of subject and predicate is directly made, is of the nature described by Kant—due to the activity of the pure *ego*, opposed to the very notion of sensible experience, and absolutely *a priori*. As we have a natural psychological experience of sensations passively received through bodily organs, we also have what is not less a natural psychological experience of motor activity exerted through the muscular system. Only by muscular movements, of which we are conscious in the act of performing them, have we perception of objects as extended and figured, and in itself the activity of the describing and circumscribing movements is as much matter of experience as is the accompanying content of passive sensation. At the same time, the conditions of the active exertion and of the passive affection are profoundly different. While, in objective perception, within the same or similar movements, the content of passive sensation may indefinitely vary beyond any control of ours, it is at all times in our power to describe forms by actual movement with or without a content of sensation, still more by represented or imagined movement. Our knowledge of the physical qualities of objects thus becomes a reproduction of our manifold sensible experience, as this in its variety can alone be reproduced, by way of general concepts; our knowledge of their mathematical attributes is, first and last, an act of conscious production or construction. It is manifestly so, as movement actual or imaginary, in the case of magnitude or continuous quantity; nor is it otherwise in the case of number or discrete quantity, when the units are objects (points or anything else) standing apart from each other in space. When the units are not objects presented to the senses or represented as coexistent in space, but are mere subjective occurrences succeeding each other in time, the numerical synthesis, doubtless, proceeds differently, but it is still an act of construction, dependent on the power we have of voluntarily determining the flow of subjective consciousness. Thus acting constructively in our experience both of number and form, we, in a manner, *make* the ultimate relations of both to be what for us they must be in all circumstances, and such relations when expressed are truly axiomatic in every sense that has been ascribed to the name.

Beyond the mathematical principles which may be thus accounted for, there are, as was before remarked, no other principles of special science to which the name of axiom is uniformly applied. It may now be understood why the name should be withheld from such a fundamental generalisation as the atomic theory in chemistry, even when we have become so familiar with the facts as to seem to see clearly that the various kinds of matter must combine with each other regularly in definite proportions: the proposition answers to no intuition or direct apprehension. At most could it be called axiomatic in the sense, of course applicable to mathematical principles also, that it is assumed as true in the body of science compacted by means of it. The laws of motion, however, formulated by Newton as principles of general physics, not only were called by him axiomatic in this latter sense, but have been given out by others since his time as propositions intuitively certain; and, though it cannot seriously be pretended that there is the same case for ascribing to them the character of *a priori* truths, there must be some reason why the name of axiom in the full sense has been claimed for them alone by the side of the mathematical principles. The *a priori* character, it is clear, can only in a peculiar sense be claimed for truths which all the genius of the ancients failed to grasp, and which were established in far later times as inductions from actual experiments; Newton, certainly, in calling them axioms, by no means claimed for them aught but an experiential origin. On the other hand, it must be conceded that motion as an experience has in it a character of simplicity, like that belonging to number and form, consisting mainly in a clear apprehension of the circumstances under which the phenomenon varies, while, again, such apprehension is conditioned by the psychological nature of the experience, namely, that it is one depending on activity of our own which we can control, and does not come to us as bare passive affection which we must take as we find it. We do in truth make or constitute motion, as we construct number and space; moving, as we please, without external occasion, and, when apprehending objective movements, following these with conscious motions of our members. Notwithstanding, our proper motions far less adequately correspond to the reality of external motions than do our subjective constructions of space and number answer to the reality of things figured and numbered. With limited store of nervous energy and muscles of confined sweep, we cannot execute at all such continued unvarying movements as occur, at least approximately, in nature; we cannot, by any such combinations of movements as we are able to make, determine beforehand the result of such complex motions as nature in endless variety exhibits; nor, again, can we with any accuracy appreciate the relation between action and reaction by opposing our muscular organs to one another. We must wait long upon experience that comes to us, or rather, in face of the objective complexity presented by nature, sally forth to make varied experiments with moving things, and thereupon generalise, before anything can be determined positively respecting motion. This is precisely what inquirers, until about the time of Galileo, were by no means content to do, and they had accordingly laws of motion which were, indeed, devised *a priori*, but which were not objectively true. Since the time of Galileo true, or at least effective, laws of motion have been established inductively, like all other physical laws; only it is more easy than in the case of the others, which are less simple, to come near to an adequate subjective construction of them, and hence the claim sometimes set up for them to be in fact *a priori* and in the full sense axiomatic.

It remains to inquire in what sense the general principles of all knowledge or principles of certitude may be called, as they often are called, axioms. The laws of Contradiction and of Excluded Middle, noted though not named by Aristotle, together with that formulated as the law of Identity, presupposed as they are in all consistent thinking, have, with a character of widest generality, also a character of extreme simplicity, and may fitly be denominated axioms in the sense of immediate principles. They stand, however, as pure logical principles, apart from all others, being wholly formal, without a shade of material content. There can be no question, therefore, of their certainty being guaranteed by a direct intuition, valid for all cases because fully representative of all; as little does there appear valid ground for calling them, in the proper sense, inductive generalisations from experience. They may rather be held to admit only of the kind of proof that Aristotle calls dialectical: whoever denies them will find that he cannot argue at all or be argued with; he cuts himself off from all part in rational discourse, and is no better, as Aristotle forcibly expresses it, than a plant. The like position of being postulated as the condition of making progress belongs to the very different principle or principles (which may, however, be called logical, in the wider sense) implied in the establishment of truth of fact, more particularly the inductive investigation of nature. Whether expressed in the form of a principle of Sufficient Reason, as by Leibniz, or, as is now more common, in the form of a principle of Uniformity of Nature, with or without a pendant principle of Causality for the special class of uniformities of succession, some assumption is indispensable for knitting together into general truths the discrete and particular elements of experience. Such postulates must be declared to have an experiential origin rather than to be *a priori* principles, but experience may more truly be said to suggest them than to be their ground or foundation, since they are themselves the ground, express or implied, of all ordered experience. Their case is perhaps best met by pronouncing them hypothetical principles, and as there are no axioms—not even those of mathematics—that are thought of without reference to their proved efficiency as principles leading to definite conclusions, they may be called axiomatic on account of their extreme generality, however little they possess the character of immediacy.

The name axiom, at the end of the inquiry, is thus left undeniably equivocal, and it clearly behoves those who employ it, whether in philosophy or science, always to make plain in what sense it is meant to be taken. Before closing, it is, perhaps, necessary to add why, in dealing with the question of origin, no account has been taken of the doctrine of evolution which has become so prominent in the latest scientific and philosophical speculation. From the point of view of the present article, that doctrine has only an indirect bearing on the inquiry. If the conditions of experience as they are found in the individual suffice to explain the different assurance with which general assertions are made in different departments of knowledge, there is no need to carry the psychological consideration farther back. The effect of such difference in the conditions of experience may, of course, be accumulated in the life of the race, and the accumulation may go far to determine the psychological history of the individual, but the question, as a rational one, must be decided upon analysis of the conditions as they are.

SENSE OF DOUBLENESS WITH CROSSED FINGERS.[1]

THE familiar psychological experiment known to every schoolboy, and noted already by Aristotle in the *Metaphysica* (p. 1011, a 33), has often in late years been made the subject of explanation in physiological books, though with little success, as far as I have seen; the explanation consisting generally in a laboured re-statement of the difficulty. What seems to me the true explanation suggested itself once when I tried the experiment, determined carefully to mark the precise phenomenon. Crossing the second finger backwards over the forefinger of the left hand held vertically with thumb uppermost, so that the under-side of the second finger (usually in contact with the third finger) rested on the upper-side of the forefinger (side next to thumb), I placed a penholder between them, bringing it first into contact with the second finger only. Causing it then to touch the forefinger also, I was struck by perceiving this second contact coming in, as it were, higher up in space, though the forefinger was then lower down. So when the forefinger was first touched, the contact with the second finger was felt as coming in lower down, though the second finger stood then higher up. The spatial reference is still more distinct when the eyes are shut and the judgment is guided by the character of the touches alone; but the most decisive form of experiment is with other people's fingers, their eyes being shut and the question being simply put: Does the second contact seem to you to come in higher up or lower down in space than the first? The report is always the same; and the interpretation is obvious. We perceive the contacts as double *because we refer them to two distinct parts of space.* The upper-side of the forefinger and the under-side of the second finger (sides understood as above) are to us distinct parts of space, because normally these two surfaces are not in contact with one another; and they cannot normally be touched simultaneously except by objects which are, or are held to be, two (supposing, that is, bare contact only). Contrariwise, the under-side of the forefinger and the upper-side of the second, being normally in contact with one another, mean to us one and the same space, so that when they are held apart by aught intervening, the suggestion is of a thing filling one and the same space, in other words, a single thing. It is here implied that every part of the tactile surface has a definite spatial character of its own, and about this as a fact there can be no question, whatever difference of opinion there be as to whether such character is original or derivative.

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[1] *Mind*, i. 145.

LOGIC AND THE ELEMENTS OF GEOMETRY. (I.)[1]

THE *Syllabus of Plane Geometry* (Macmillan and Co., 1875) newly issued, after much deliberation, by the Association for the Improvement of Geometrical Teaching, includes an introductory section which sets forth the logical interdependence of certain associated theorems. In particular, four typical forms of theorem are given as standing in various important relations to one another:—

If A is B, then C is D (1)
If C is not D, then A is not B (2)
If C is D, then A is B (3)
If A is not B, then C is not D (4)

(1) and (2) are said to be *contrapositive* each of the other; (3) is called the *converse*, and (4) the *obverse*, of (1). Now, says the *Syllabus*, while (2) may be always got from (1) by logical inference, it is not so with (3) or (4); each of those by itself requires a geometrical proof independent of the proof of the original theorem; but yet both do not require to be independently proved, because they are themselves in turn (logically) contrapositive each of the other. It will therefore "never be necessary to demonstrate geometrically more than two of the four theorems, care being taken that the two selected are not contrapositive each of the other".

This view of the relations of the four propositions is not new, even in England, being found in more than one recent work. The *Syllabus*, however, makes an important advance in nomenclature. Hitherto theorem (4) has been designated by the name of *opposite*, used in such glaring inconsistency with the tradition of logical science and with common understanding — opposites plainly being propositions that cannot both be true—that it is difficult to see how the confusion could ever have been tolerated. The word *obverse*, now beginning to be employed in formal logic for what used to be called the *equipollent* proposition—a logical form that has a relation to (4) analogous to that borne by the pure logical *converse* to (3)—was suggested to the Association as a substitute for the so-called *opposite*, and being frankly accepted, will now, it is to be hoped, for ever displace that unfortunate misnomer.

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[1] *Mind*, i. 147.

So far well, but the logician's interest in the scheme does not end with this rectification. Is it open to the geometer to appropriate the words *converse* and *obverse*, and use them in a sense which, if it is not inconsistent with, is at least different from, their original logical application? The words so aptly express the propositions which the geometer has in view, being those which in his (relatively) material science correspond to the converse and obverse of pure formal logic, that he may very fairly appropriate them. At the same time the logician may still more fairly claim that his own original use of the words shall not be put out of view, seeing it is implied (as, from the fundamental character of logical science, it cannot but be implied) in the usage of the geometer. The pure logical converse of (1) is "In at least some case where C is D, A is B," or "If C is D, A may be B," and this is implied by the geometer in saying that *his* converse, "If C is D, A is B" (amounting to the logician's *inadmissible* simple converse of a universal affirmative proposition) needs by itself a geometrical proof. So the pure logical obverse of (1) is "If A is B, C is not other than D," and this is implied by the geometer in saying that *his* obverse, "If A is not B, C is not D," also by itself needs to be proved geometrically. Nor, if the geometer should deny that he does imply logical forms of which he may be ignorant, is the denial of any avail when he accepts (2) under the name of *contrapositive*, and thus expressly accords a place within his science to a process (contraposition) which is not only purely formal, but is, in fact, logical conversion applied in a special manner. The question of real importance, then, is the practical one, how the reference to logical principles may most effectively be made. The mode of reference adopted in the *Syllabus* cannot be pronounced in all respects satisfactory.

The scheme of the four associated theorems, though it has a certain symmetry, is open to objection in that it mixes up logical and extralogical relations. The relation of (3) to (1), or of (4) to (1), is extralogical, while the relation of (2) to (1) is purely logical. Would it not be simpler and better to take account only of the "converse" and "obverse" in relation to (1), and say that either of these two, by itself, needs to be demonstrated geometrically after (1), but both need not, because logic starting with either will give the other? Of course logic will yield a contrapositive of (1), but why particularise this as (2), when it may be assumed along with still other strictly logical transformations? In the way here suggested, a beginner would, at all events, get a distincter notion of the difference between logic and geometry; and if the plan involved the necessity of somewhat more expressly stating what is the true nature of such a logical process as contraposition, so much the better. There is some confusion in the *Syllabus* on this head.

Thus theorem (2) may unquestionably be obtained from (1) by the strict logical process of contraposition, and would now be called by most logicians its contrapositive (though, by the way, it is a negative, not a positive, proposition); but (1), although in turn it follows logically from (2), cannot be won back by contraposition, any more than a universal affirmative when converted logically into a particular affirmative can be restored, by a second conversion, to its original universal form. The process called contraposition, in all cases where it is applicable, consists of two stages—obversion and conversion. For example, the simple categorical proposition, "All S is P," becomes when obverted, "No S is not-P," and this last, being further converted, becomes "No not-P is S," the contrapositive, as it is called, of the original proposition. Now, obviously, this contrapositive cannot be made to yield the original "All S is P" by further contraposition (obversion and conversion), for "No not-P is S," being obverted, becomes the affirmative "All not-P is not-S," and this, being converted, gives "Some not-S is not P," quite a different proposition from the original one. To get "All S is P" back again we must proceed, not by obversion and conversion, which together *in this order and only in this order* make contraposition, but by conversion first and then obversion —an order of procedure perfectly valid in logic, but unprovided with a special name. Applying this to the case in hand, as (1) cannot be called the contrapositive of (2), so neither can (3) and (4) be called contrapositives of one another: if (4) is the contrapositive of (3), (3) cannot be the contrapositive of (4).

Let it not be said that the point here insisted on is a trivial one—that it is a mere question of naming. If it is important for learners to distinguish between a geometrical process and one purely logical, as the placing of this "Logical Introduction" at the head of the *Syllabus* implies that it is, there can be no controversy as to the necessity of exactly determining the character of the logical process. To call (1) and (2), or (3) and (4), contrapositives of one another, tells the geometrical learner little more than that there is a process called contraposition, which, if applied, will often save him much trouble. As long as he works with simple typical instances of theorems like (1) and (2), it is easy for him to see that the logical equivalence, by whatever name it is called, must hold in both directions, if it is asserted in one; but, when he comes to deal with actual geometrical propositions, even not very complex ones, he will find it difficult to assign the correct contrapositive, unless he is told definitely by what fixed line of logical transformation it may always be reached. In default of special instruction, he will hardly be able to draw from the examples of contraposition signalised throughout the *Syllabus* a consistent notion of the process. At the best, these examples need a good deal of transformation, verbal if not logical, before they could be seen by a young student to correspond with the typical theorems which are all he has to guide him. One example, on page 16, illustrates the graver confusion, or rather the positive error of reckoning as contrapositive the passage from (2) to (1). It is there said that Theorem 24, "Straight lines that are parallel to the same straight line are parallel to one another," is the contrapositive of Axiom 5 (p. 15)—"Two straight lines that intersect one another cannot both be parallel to the same straight line". In truth the theorem follows almost directly from the axiom, which is a universal negative proposition, by the process of simple (logical) conversion: there is further necessary a change in the expression amounting to (formal) obversion, but the first was the really critical step. Here, then, it is not logical contraposition, but logical conversion, which it concerns the geometrical student to understand, not to say again that contraposition always involves formal conversion. In short, it is impossible to frame any notion of the process of contraposition which shall apply, as is required in the *Syllabus*, equally to affirmative and negative propositions, unless it is taken to mean simply the establishment of logical equivalence; and even then it would still be necessary, before making any use of the process, to determine in what different ways equivalence may be secured. We are thus inevitably brought back to the assumption of more than one process, however called.

The conclusion, then, to which I venture to come is that, unless logical principles are set forth more explicitly than in the *Syllabus* and other recent geometrical books, the reference to them is little likely to be of practical service to beginners. One thing is certain, that, if logical principles were familiar to the geometrical beginner, he would both learn geometry better and at the same time, in the process, singularly strengthen his grasp of logical principles. The notion will be scouted that a boy should be expected to have learned logic before beginning geometry, and I by no means argue that he should; but I would yet maintain that nothing could be easier than to give boys along with instruction in grammar all the knowledge of logical principles that is necessary as a preparation for their instruction in geometry. For this, doubtless, it would be necessary that teachers of grammar should have learned logic, but that is not a very extravagant requirement.

LOGIC AND THE ELEMENTS OF GEOMETRY. (II.)[1]

DR. HIRST, on retiring lately from the presidency of the Association for the Improvement of Geometrical Teaching, has taken notice of some observations made by me, in the first number of this journal, with reference to the Logical Introduction to the *Syllabus of Plane Geometry* issued by the Association in 1875. As it is very important that logical theorists on the one hand and scientific workers or teachers on the other should lose no opportunity of mutual understanding, Dr. Hirst's remarks are (with his permission) here reproduced from the Association's *Report* for this year (1878), and some words of explanation are appended in reply. Dr. Hirst says:—

"The Editor of *Mind*, after drawing attention to the diversity of meaning attached by geometers on the one hand, and pure logicians on the other, to the words 'converse' and 'obverse,' concedes that these terms are so appropriate for his purpose that the geometer is fairly entitled to appropriate them in his own sense. Immediately afterwards, however, he protests against what he considers to be an error on our part, but what in reality is no error at all, but a necessary sequel of the concession he has just made. With regard to the two propositions which stand first in our Logical Introduction—the typical forms of which, if you remember, are—

(1) *If A be B, then C is D,*

(2) *If C be not D, then A is not B,*

he deems it inaccurate to say, as we do, that they are contrapositive *each of the other*. He admits that the second is contrapositive to the first, but denies that the first is contrapositive to the second, and this because the process of contraposition is, to him, obversion followed by conversion, and not conversion followed by obversion. He overlooks the fact, however, that these processes of obversion and conversion, as understood by the geometer, may be applied in either one or the other order, successively, without at all altering the final result; so that if once the propriety of terming the second of these propositions the contrapositive of the first be conceded, it can no longer be contested that the first must also be termed, by the geometer, the contrapositive of the second. Of course, it is admitted, on both hands, that these two propositions are logically equivalent, and therefore it might, at first sight, appear that the question at issue is merely one of terminology. This is, however, by no means the case. In fact, the writer himself admits that 'this is no mere question of naming,' and he justly observes that 'if it is important for learners to distinguish between a geometrical process and one purely logical, as the placing of this Logical Introduction at the head of the *Syllabus* implies that it is, there can be no controversy as to the necessity of exactly determining the character of the logical processes involved'. On this point I can only say that it was unquestionably our intention that the teacher should supply the determination here desiderated. It was not thought consistent with our purpose, however, to introduce these explanations into the *Syllabus*, and I, for my part, regret that such was the case, since our omission has led to misapprehensions of a still graver character than the one I have now alluded to. I was hardly prepared to find that, 'in default of special instructions,' even an accomplished logician finds himself unable 'to draw from the examples of contraposition signalised throughout the *Syllabus*, a consistent notion of the process,' and I was still less prepared for the authoritative declaration that 'it is impossible to frame *any* notion of the process of contraposition which shall apply, as required in the *Syllabus*, equally to affirmative and negative propositions'. Let us see if the geometer's notion of contraposition—for a notion he certainly has—is really so restricted. He first of all distinguishes carefully between the two parts or statements involved in every theorem; the truth of one of these—the predicate—is asserted to be a consequence of the truth of the other—the hypothesis. Now to each of these two statements, no matter whether it be of an affirmative or negative character, there is a distinct opposite, by which I mean a statement which directly contradicts the original. This granted, the process of contraposition may be said to consist, simply, in the formation of a new theorem whose hypothesis shall be the opposite of the predicate of the original, and whose predicate shall be the opposite of the former hypothesis. From this it will be seen that the process is not affected in the least by the affirmative or negative character of either the hypothesis or predicate. It is further obvious that the process of contraposition, thus defined, is a composite one. It consists, in fact, of the interchange of hypothesis and predicate, which is conversion, accompanied by the denial of hypothesis and predicate, which in itself constitutes obversion. And it is moreover evident, lastly, from what has been explained, that it is a matter of perfect indifference which of the two last-named successive processes we first apply; so that if of two theorems one is the contrapositive of the other, then from our point of view, necessarily, the first is also the contrapositive of the second; in other words, the relation we characterise by the term contrapositive is a perfectly reciprocal one."

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[1] *Mind*, iii. 564.

Thus far Dr. Hirst. In reply, I may perhaps be allowed to remind those who take an interest in this subject that the point of my observations was to urge the advantage and even necessity of extending the reference so laudably made in the *Syllabus* to the processes of logical transformation of propositions. The occasion was of this kind. While some steps are marked off in the *Syllabus* as purely logical and are called by their recognised names, certain other processes of an extralogical character are called by the name of the logical processes to whose type they may be said to approach. Thus the purely logical process in passing from (1) to (2) above is called, as logicians now call it, Contraposition, but the logicians' word Conversion is employed to mark such a step as that from *If A is B, C is D* to *If C is D, A is B,* which is not good in logic. Now, as explained in my original Note and here repeated by Dr. Hirst, I did not complain of this; and indeed it was I that recommended to the Association the use of the logical word 'obverse' (for what in the previous modern books was very perversely called 'opposite') in a like transitive application. But then it clearly becomes very important that there should be no confusion between the original and derived use of the words, and I did not see how this could be avoided except by a more explicit statement of the fundamental logical processes than the *Syllabus* offered.

How real the danger is, Dr. Hirst must pardon me for thinking that his own remarks now show. When I say that Contraposition involves first Obversion and then Conversion, he, having occasion to use these latter words, as a geometer, in the extralogical sense, supposes that I must mean them thus here, and blames me for not seeing that the geometer may apply the processes indifferently in any order. But if Contraposition is, as all allow, itself a purely logical transformation, there can be no question of resolving it into anything but *logical* Obversion and Conversion; nor can the fact that the geometer may equally well begin with either of *his* steps first, in any way affect my logical statement. I deny, of course, that the logical process of Contraposition consists of the two extralogical processes in any order. If (1) is 'obverted' into *If A is not B, C is not D*, no doubt this being logically converted becomes (2); but, as is very properly remarked in the *Syllabus*, the first step is not warranted in logic, and it surely cannot be assumed in order to arrive at the legitimate contrapositive. If, on the other hand, we begin by 'converting' (1) into *If C is D, A is B*, here no doubt, with the help of the original proposition, we are entitled to pass to the so-called 'obverse' *If C is not D, A is not B*, but the extralogical 'conversion' was illogical. Either way, then, it is no true account of Contraposition to say that it consists of Obversion and Conversion in the extralogical sense given to them by the geometer. Contraposition can be understood as involving Obversion and Conversion only in the strict logical sense; and in this sense the question of order is not indifferent. You can get (2) from (1) logically only by Obversion followed by Conversion; you can get (1) from (2) logically only by Conversion followed by Obversion. If in either case the order of procedure is reversed, the result would be quite different. Now, if there happen to be reasons for calling by the name of Contraposition that order of procedure in which Obversion is taken first, the name cannot without confusion be applied to the reverse order which yields a quite different result; and this is what I maintained when I denied that the passage back from (2) to (1) is properly to be described as Contraposition, and declared it impossible to frame any notion of the process that shall apply equally to affirmative and negative propositions. Dr. Hirst, indeed, gives us, in other language, a view of Contraposition that seems to apply generally; but, however it may meet the practical requirements of the geometer, it only discloses anew the logical difficulty. When he divides a theorem into the two parts which geometers (again making perverse use of logical language) call hypothesis and predicate, and tells us to substitute the 'opposite' of each for the other in Contraposition, how is it known that this is an admissible substitution? The geometer will not be able to reply without entering into precisely those elementary logical considerations which it was my plea to have explicitly set out at the beginning of a geometrical course.

The particular point at issue—whether the passage from (2) to (1) above may equally well with the passage from (1) to (2) be described as Contraposition—is settled for the logician (to whom the question belongs) by a reference to the origin of the process so named. Contraposition arose out of Conversion. While the typical propositions *A*, *E*, *I* might all be converted in one way or another, the particular negative *O*—*Some S is not P*—proved inconvertible. Was there then no way of making the subject *S* stand as predicate? Yes: by obverting the proposition into what used to be called its 'equipollent' *Some S is not-P*, this could be converted (as *I*) into *Some not-P is S*; and the process was called Conversion by Negation or Contraposition, also in course of time simply Contraposition. No sooner, however, was it recognised, than the question must arise whether it was applicable to *O* only. It could not, indeed, be applied to *I*, because *I* being obverted into *O* could not then be converted; but it could be applied to *A* and *E*. Only, whereas in Conversion *A* suffered (being degraded from *All S is P* into *Some P is S*) but *E* retained its universality (*No S is P* becoming *No P is S*),—in Contraposition, on the other hand, while *A* retained its universality (*All S is P* becoming *No not-P is S*), *E* suffered (being degraded from *No S is P* into *Some not-P is S*). Now, upon this showing, it is quite clear, as I argued originally, that theorem (2) above, corresponding as it does with the categorical *E*, cannot by this way of Contraposition be brought to (1). It can be brought to (1) only by being first converted and then obverted—a perfectly valid logical transformation, but not Contraposition. When contraposed, (2) becomes the very different proposition *In some case when A is not B, C is not D.* In short, (1) and (2) cannot be called mutually contrapositive except by a new definition of Contraposition, which shall make it cover Obverted Conversion as well as Converted Obversion. Is such a definition possible? Of course, it is possible—at the expense of logical usage: when I declared it impossible, it was on the supposition that logical usage should be maintained. Is it advisable as well as possible—advisable, that is to say, for the practical purposes of the geometer? I care not even if this should be asserted, because I am sure that the definition cannot be satisfactorily given except as based upon such an explicit reference to the fundamental processes as would satisfy any logician—when the whole business, indeed, becomes "a mere question of naming".

I end with one more remark, already thrown out in *Mind*, No. 3, p. 425, but which, in view of these misunderstandings, I would now accentuate. It is that geometers should abandon the use of the logical terms *converse* and *obverse* for extralogical relations. The terms *inverse* and *reciprocal*, used by M. Delbœuf in his *Prolégomènes philosophiques de la Geométrie* (Liége, 1860), p. 88, are equally significant, while they lead to no confusion with the purely logical processes that should be familiar to every scientific reasoner—Obversion and Conversion as well as Contraposition.

JEVONS'S FORMAL LOGIC.[1]

MR. JEVONS'S work, *The Principles of Science*,[2] since its appearance more than two years ago, has not received anything like the amount of attention it deserves. That such a book should have remained so long unnoticed by the greater reviews that could devote sufficient space to the critical appreciation of its contents, is indeed a signal proof of the need for a special philosophical journal. An attempt will be made in these pages to examine it with due care. It is a work of much excellence, yet also, as it seems to the present writer, open to exception in many ways.

Mr. Jevons begins by expounding a theory of Formal Logic, deductive and inductive. Upon this basis he proceeds to explain the science of Quantity, especially Number, as an outgrowth from pure logic, and in the same relation deals particularly with the theory of Probability, of which he finds the scientific—or, as he commonly calls it, the inductive—investigation of Nature to be a mere application. He next turns aside to set forth the various Methods of Measurement employed in quantitative research. Then follows in full detail his doctrine of Inductive Investigation, with a subsidiary treatment of Generalisation, Analogy, &c., and a preliminary handling of Classification, to be carried out in a future work. Meanwhile the present work reaches its term with some general reflexions on the results and limits of Scientific Method.

The Methods, rather than the Principles, of Science would perhaps be a more appropriate title for the book as it stands. Systematic investigation of principles in any philosophical sense of the word there is none. On the other hand, the exposition of methods employed in the actual investigation of nature is most elaborate and altogether admirable. No such exposition existed before; and, as far as the present writer can judge or can learn from the judgment of competent authorities, the accuracy of Mr. Jevons's acquaintance with the most varied departments of science is singularly great. As a methodologist he has fairly outstripped predecessors as great as Herschel, Whewell and Mill.

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[1] *Mind*, i. 206.

[2] *The Principles of Science: A Treatise on Logic and Scientific Method*, by W. STANLEY JEVONS, M.A., F.R.S. 2 vols. 1874. Macmillan & Co.

If the book really corresponded to its title, Mr. Jevons could hardly have passed so lightly over the question, which he does not omit to raise, concerning those undoubted principles of knowledge commonly called the Laws of Thought. The question is whether these are subjective or objective, and Mr. Jevons is of opinion—an opinion in which he does not stand alone—that they are at once subjective and objective. One wishes, however, that he had given some reasons for his view, and not, in a book dealing expressly with the Principles of Science, contented himself with the bare statement that he is "inclined to regard them as true both in the nature of thought and things" (i. p. 9). Everywhere, indeed, he appears least at ease when he touches on questions properly philosophical; nor is he satisfactory in his psychological references, as on pp. 4, 5, where he cannot commit himself to a statement without an accompaniment of "probably," "almost," or "hardly". Reservations are often very much in place, but there are fundamental questions on which it is proper to make up one's mind. Judged by his book, Mr. Jevons does not equal either Whewell or Mill in philosophical grasp.

The present article will treat only of the first part of the work,[1] in which the author following in the track of recent logicians seeks to recast the traditional doctrine of Formal Logic, by propounding a new principle of reasoning and, in furtherance of its application, devising an appropriate system of symbolic expression for logical propositions. Since the doctrine of the Quantification of the Predicate was first enunciated in this country by Mr. George Bentham in 1827, and brought into vogue later by Hamilton, various attempts have been made to set aside the older doctrine of proposition and inference which originated with Aristotle; and of late years no one has laboured so persistently at the double work of demolition and reconstruction as Mr. Jevons. In two previous essays, *Pure Logic* (1864), and *Substitution of Similars* (1869), also in a variety of special papers, he has felt his way towards the doctrine which he now propounds in a form that, if not final, yet appears to him sufficiently developed to supersede at once all other modern doctrines and that ancient one against which they were levelled. It is advanced as embodying all the anti-Aristotelian import of the newer theories; at the same time, as systematised or organised beyond any of them; and yet withal as perfectly simple in principle and details when compared with the greatest among them —the very complex and long-drawn system of the late Prof. Boole. Nor does Mr. Jevons at all exaggerate the merits of his doctrine in relation to his compeers. He is superior to Boole not only in the simplicity and directness of his logical processes but also in his conception of the relation of logic to mathematics. His own doctrine of Number is not in all respects satisfactory, as may on another occasion be shown, but his arguments (pp. 173, 4, *et alib.*) against Boole's notion of logic as a special kind of algebra, are excellent and decisive. We may proceed then to consider Mr. Jevons's doctrine as the best outcome of the modern revolt against the Aristotelian system, sure that nothing has been urged in opposition more strongly than he urges it.

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[1] Even this to the exclusion of the last chapter in it, dealing with formal Induction, which will best be considered in connexion with Mr. Jevons's general doctrine of inductive inference.

Mr. Jevons's Introduction may be described as a summary plea for a statement of the reasoning process which shall be strictly universal and not, "like the ancient syllogism," cover "but a small and not even the most important part" of the whole extent of logical arguments. The universal principle (of "Substitution") suggested is in these words: "So far as there exists sameness, identity or likeness, what is true of one thing will be true of the other". Here there is evidently implied an expression of logical propositions in the form of equations, and accordingly a general justification is offered for such a mode of expression, while an appropriate system of symbols is indicated. A chapter on Terms is then placed first according to the usage of logicians, and Mr. Jevons has both amendments and advances to propose upon the common doctrine, besides fixing more exactly the nature and conditions of his symbolical expression of the terminal elements of propositions. The next chapter deals with Propositions themselves, and contains all the express arguments the author has to offer for putting them into the equational form. He is now in a position to treat of Direct Deduction, which consists in an application of his principle of Substitution to the terms of (equational) propositions under the first law of thought (Identity), and here he seeks to show how small a part of all deductive reasoning is represented by the forms of Syllogism, also how imperfect is the representation. There remains the process of Indirect Deduction, consisting in the practice of Substitution under the laws of Contradiction and Excluded Middle (Duality) as well as Identity; this has however to be prefaced by a consideration of Disjunctive Propositions, since the alternative relation (*either-or*) is employed in the expression of any logical notion in terms of another according to the law of Duality. The Indirect Method of Inference is introduced at first as a merely supplementary process, to be resorted to as the means of proving that a thing cannot be anything else than a particular thing when it cannot be directly proved to be that thing; but it shows itself so powerful that it ends by swallowing up Direct Deduction and remaining alone in the field as the truly universal process of reasoning. It proves to be able to furnish a complete solution of the universal problem: Given any number of logical premisses or conditions, required the description of any class of objects or any term as governed by those conditions; and being a process that follows a fixed unalterable course in all cases, it can be shortened and facilitated by a number of contrivances, on which Mr. Jevons has spent much inventive power. The most remarkable is his famous logical machine, which in a most ingenious fashion does unerringly perform the work of pure logical combination, the mind by a conscious process having first brought the premisses given into a definite symbolic form and again at the close having to interpret the results mechanically attained.

There is some difficulty in assigning the precise *idée-mère* of the system. Mr. Jevons does not say whether reasoning is what he describes it—a process of substitution—because propositions ultimately understood are equations, or whether it is the substitutive character of reasoning that necessitates the adoption in logic of the equational form. On the whole the latter seems to be his view, since he allows that propositions may be expressed otherwise; but in any case the two positions are involved with each other in his mind, and it is evident from the beginning that it will be a main part of his task to develop a doctrine of Proposition suited to the principle of Substitution. Hence the rough outline of such a doctrine advanced in the Introduction; where he maintains that the analogy between the relation of subject and predicate in logical propositions and the relation of the two terms in mathematical equations justifies the use of the mathematical sign = for the logical copula. At this stage he does not urge that the sign ought always to be so employed, for he even speaks (p. 20) of equality as but one of many relations that may subsist between logical terms, and from this point of view gives to the general formula of logical inference the new expression: "In whatever relation a thing stands to a second thing, in the same relation it stands to the like or equivalent of that second thing". Here also, however, one equation is presumed before the reasoning, as understood by Mr. Jevons, can proceed, and the critical question remains how to determine equivalence in logical propositions generally. That it can be done is clear to Mr. Jevons, when he asserts shortly afterwards (p. 29) that "every proposition expresses the resemblance or difference of the things denoted by its terms"; but this of course is the very point to be proved, and the mere assertion decides nothing.

The chapter on Terms may be lightly passed over. Mr. Jevons, in as far as he adopts the common distinctions (general-singular, abstract-concrete, collective-distributive and the like) does not add anything of importance to the determination of their character, while some of his statements are decidedly loose. In particular he confuses the *singular* and the *proper* name when he charges logicians with erroneously asserting that singular terms are devoid of meaning in intension: Mill, whom he points at, never says any such thing of singulars—says of many singulars quite the reverse—and in denying connotation to proper names is surely correct. Mr. Jevons himself would set up a new class of terms under the name *substantial*, which he finds, oddly enough, to partake of the nature both of abstracts and concretes. Gold, for instance, is a concrete substance, yet it has a uniformity or unity of structure—being gold with all its qualities in every part of it—which allies it with abstracts like redness; for redness, according to Mr. Jevons (p. 34), "so far as it is redness merely, is one and the same everywhere, and possesses absolute oneness or unity". Logicians, he complains, have taken very little notice of such terms. But why should they take any notice of a distinction that is wholly material or extra-logical? Gold is a concrete, so is water and so is lion. What matters it to the logician that you always break up gold, being an elementary substance, into parts of identical character, but not always water, because water is a compound, and never lion, because lion is an organism? If Mr. Jevons will embark upon such distinctions, he will not soon come to the end of them. This one, too, is not happily named. Are not lion and water also substantial? The fault extends to Mr. Jevons's account of collective terms, as the reader may see on p. 35. What remains of the chapter has its importance in relation to the symbolic expression of terms in propositions, and to the central doctrine of Proposition let us pass.

It is now Mr. Jevons's express object to show that all forms of proposition "admit the application of the one same principle of inference that what is true of one thing or circumstance is true of the like or same" (p. 43), and this, we understand, amounts with him to proving that all propositions may be expressed as equations. Propositions, he begins by saying, may assert an identity of time, space, manner, degree or any other circumstance in which things may agree or differ, and in support he cites a number of instances where the notion of sameness or equality is expressed or more or less distinctly implied in the *predicate*. No doubt, there is a sense in which such propositions assert identity, but they make nothing for the general thesis that identity of some kind is what all propositions express. Proceeding however to maintain the thesis in regard to all propositions involving "notions of quality" (which is as much as to say all *logical* propositions whatever),[1] he finds at once that "the most important class" consists of assertions which may be called "Simple Identities," represented by the formula A = B. Let us look at these more closely.

As illustrations of Simple Identities, Mr. Jevons adduces two cases of similar sensible qualities, one or two cases of verbal synonyms, some cases of propositions with singular names as subjects, some cases of definitions, one case of a number of objects brought together into a collective expression, some geometrical equations (*e.g.*, Equilateral triangles = Equiangular triangles), and some expressions concerning uniform and exclusive co-existence of qualities (*e.g.*, Crystals of cubical system = Crystals incapable of double refraction). He mixes all these up together as if they were of equal importance logically; but, while some of them are irrelevant, being propositions of the kind noted before in which the identity or similarity asserted is really part of the predicate, others, it is plain, are propositions only by courtesy, being either of no logical importance, because they are assertions about mere names or about singular things under proper (meaningless) names, or logically important as definitions not as propositions. In short, none of the illustrations are of any real account for Mr. Jevons's argument except those falling under the last two heads of the foregoing list. Real or synthetic propositions like those involved in the equations cited or in another often mentioned by Mr. Jevons, Exogens = Dicotyledons, are alone worthy of consideration. Let Mr. Jevons claim all the others as simple identities, similarities or what not as he will, and make formal equations out of every one of them. The question remains whether a real proposition about equilateral triangles or exogens can be legitimately put into the form of an equation with the mark = for copula, or whether equations like those quoted represent the propositions with which logic has to deal.

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[1] Mr. Jevons speaks here (p. 44) of "confining attention" to the propositions thus described, and leaving over propositions concerned with number and magnitude. In fact he leaves none over, for propositions *about* quantity, which are those he has in view, do in respect of logical form involve what he calls "notions of quality" as much as any others (else, how should logic be the truly fundamental science?); and accordingly he does not scruple (p. 46) to refer to such among others in spite of any previous exclusion.

In point of fact, as Mr. Jevons is forward to allow, logic has many propositions to deal with that are anything but Simple Identities, *e.g.*, Mammals are vertebrates; and propositions of this type, in which the subject is commonly said to be included within the predicate, were taken by Aristotle as fundamental. For this act and his supposed consequent neglect of Simple Identities, the venerable father of logic has many reproaches showered on him (pp. 46, 48, 50, &c.), but Mr. Jevons should look into the *Prior*, to say nothing of the *Posterior*, *Analytics* and see if Aristotle was as oblivious as he supposes. Choosing to take his Simple Identities as fundamental, Mr. Jevons has to bring the other class into relation with these, and very curious it is to watch his procedure. He had pronounced Simple Identities "the most important class," "all-important," &c., and one would expect the others to be less important. From the first, however, he is forced to call them "an almost equally important kind" (p. 47), while later on they prove to include "the great mass of scientific truths" and "the most common of inductive inferences" (p. 149): they also enter into inferences "almost more frequently" than any others (p. 66). He observes besides that "in ordinary language the verb *is* or *are* expresses mere inclusion more often than not" (p. 48), an assertion which, though far from correct—for in truth the copula by itself means neither inclusion nor identity—affords, one would think, with the other statements as to the scientific importance of this class of propositions, a very sufficient justification for Aristotle's selection of them as fundamental. Mr. Jevons notwithstanding will have identities made of them in subordination to his grand class (how grand we have seen!) of Simple Identities, and asserts, like others before him, that, though in the proposition, Mammalians are vertebrates, the terms are not simply identical, still there is identity between the mammalians and part of the vertebrates. Let the relation then be called a "Partial Identity". Quantifiers of the predicate insert the word *some*, and Boole uses a special symbol V, to mark the partial character of the identity: Mr. Jevons prefers another mode of symbolism. Mammalians (A) are identical with all vertebrates (B) that are mammalians (A): hence we may write $A=AB$, a form, he maintains, which at once fully expresses the whole content of the proposition and brings it into line with the fundamental class of Simple Identities. Add that, in order to get uniformity of copula (to be marked by the sign of equality), he does away with the distinction of affirmative and negative propositions, after the manner of Hobbes and others, by attaching the mark of negation to the predicate, while, after De Morgan, he chooses italics for the symbolic expression of negative terms (*a* for not-A), and we have before us perhaps all that is necessary for the understanding of Mr. Jevons's expression of propositions.[1]

But we have still to learn the exact meaning of such a Simple Identity as Exogens = Dicotyledons. It means, says Mr. Jevons on p. 19, that "the group of objects denoted by the one term is identical with that denoted by the other in everything except the name". The identity, he further remarks, "may sometimes arise from the mere imposition of names, but it may also arise from the deepest laws of the constitution of nature". Here and in the words which follow on p. 20, Mr. Jevons clearly enough indicates the difference of verbal and real propositions which in his illustration of Simple Identities he confuses or ignores; but this by the way. To return to the example, he makes still another remark (p. 19), that it is "a logical identity expressing a profound truth concerning the character of vegetables". There is here perhaps a faint suggestion that somehow the *qualities* connoted by the two terms are identical, but Mr. Jevons's view thus far plainly is that the only identity in the case is identity of objects denoted: the qualities connoted by the terms are indeed expressly different. So elsewhere (p. 58) he tells us pointedly that the equation means "that every individual falling under one name falls equally under the other". He adds, it is true, an alternative reading—"That the qualities which belong to all exogens are the same as those which belong to all dicotyledons"—which seems at variance with the other; but, rightly understood or given, it comes to the same thing. As it stands, the reading is of course erroneous if it means, as the words most naturally suggest, that the exogenous quality and the dicotyledonous quality are identical, not to say that it would, if valid, turn the proposition into one purely verbal. The true reading, however, which Mr. Jevons must be supposed to have in view is—that the qualities which belong to all exogens as such and the qualities which belong to all dicotyledons as such are always found together in the same objects. Thus we are brought back to identity of *objects*. And it may be freely granted that, where there is such thoroughgoing identity of the objects denoted by two names of different connotation, the substitution of one for the other is in this sense admissible that precisely the same objects will always be pointed at by either. It is also, no doubt, possible to mark this particular fact by the use of the mathematical sign for equality.

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[1] He distinguishes, it is true, another "highly important class of propositions" (p. 51) under the name of Limited Identities, with the formula $AB=AC$, meaning: "Within the sphere of the class of things A, all the B's are all the C's;" but this class we may neglect. I remark only in passing that the example given by Mr. Jevons—Plants that are large are the plants that are devoid of locomotive power—though one sees how it *might* be represented by the formula, can hardly be so represented consistently with his symbolic expression of the other classes.

Next as to Partial Identities. It is equally true, in the expression Mammalians = Mammalian Vertebrates, that the same objects are indicated or denoted by the two terms of the equation; and the substitution in any case of the one for the other will always be admissible in the sense that precisely the same objects will continue to be meant under the more complex as under the simpler description. So far there is no more objection to the equational form here than before. But how then is the identity, what Mr. Jevons here calls it, *partial?* It is as complete as in the class of Simple Identities: indeed, if it were not so, it would be impossible to use the sign of equality or to practise that process of substitution (reasoning) for the sake of which the equational expression is adopted. What Mr. Jevons means by calling it partial is of course plain enough: he is thinking of the terms, not as they appear after manipulation in the equation, but as they appeared in the original proposition, where the terms are not simply interchangeable—do not indicate precisely the same objects—but are interchangeable only under certain conditions laid down in the doctrine of logical Conversion. In short, the equation in this case appears as a highly artificial expression for the natural proposition—artificial in the literal sense that work has had to be done upon the proposition to bring it into the new form, and, if it is called a *partial* Identity, artificial also in the other sense of being a hybrid form—neither proposition nor equation. Mr. Jevons, it may here be added, claims as the first fruit of his theory—that it supersedes the whole doctrine of Conversion (p. 55); and we are now in a position to judge with what reason. If you take a proposition, Mammalians are vertebrates, and first carefully inquire what limits must be put upon the interchange of its terms, and then express those limits by a symbol, and finally, as you then may, express the whole as an equation, the very meaning of which is that it holds either way,—no doubt, you need the doctrine of Conversion no more; but you have assumed and used it in the preliminary process all the same. In truth, you have at the end not only surmounted Conversion: you have also got rid of Subject and Predicate—which means, if it means anything, that in attaining Equation you have abolished Proposition. Perhaps it is well so, but at least let it be understood, and let us talk no more in logic of "propositions".

Mr. Jevons, however, is perfectly aware that his expression for the common logical proposition may seem "artificial and complicated," and he gives due notice that it is on "general grounds" he contends for reducing every kind of proposition to the form of an identity (p. 50). These grounds, in character mainly practical, we shall presently examine, but the prior theoretic question, least thought of by Mr. Jevons, must first be once for all considered. The question is whether the logician, dealing with Thought, must start from Equations of the type A = B or from Propositions of the type A is B. If from Equations, they will be of the type of Mr. Jevons's Simple Identities, because all others, for example Partial Identities, are intelligible only as approximations to the simple type, and, but for the existence of the class represented by A = B, it would hardly occur to anybody to express the proposition A is B in the form of an equation (A = AB or otherwise). If from Propositions, they will be of the common type A is B, because no simpler conjunction of subject and predicate can be assigned. The question then resolves itself into another: Which of the two expressions is really the simpler and truly represents the fundamental act of Thought?

Mr. Jevons can only be understood as maintaining that it is the expression A = B. This appears from the whole course of his exposition, from his oft-repeated attacks on Aristotle (who took precisely the opposite view), and very expressly in a passage (p. 135) where he stigmatises as "the most serious error" of De Morgan's logic his holding "that because the proposition All A's are all B's (A = B) was but another expression for the two propositions All A's are B's and All B's are A's it must be a composite and not really an elementary form of proposition". That is to say: the expression A = B *is* an elementary form of proposition and, for the reason just stated, *the* elementary form. But Mr. Jevons nowhere denies, nay himself repeatedly asserts, that the one expression A = B may be resolved into, or, what is the same thing, includes the two expressions A = AB (A is B) and B = BA (B is A); while his ingenious logical machine positively refuses to entertain the Simple Identity except in this double form. How can he then deny that the proposition A is B is in the truest sense simpler and more fundamental than the manifestly complex expression A = B; that this latter is not a logical proposition at all but a shorthand expression for two logical propositions which cannot further be resolved? All that he says in reply to the dumb protest of his machine is that he does not think the "remarkable fact" of its taking in only the common logical proposition does really militate against the simplicity of his equational form A=B (p. 129). All the argument that he urges for the simplicity of the form is given at p. 71, where he asserts it to be more "simple and general" than either A is B or B is A, apparently because it follows from the two taken together and contains as much information as both of them! That seems a strange inversion of the meaning of generality and simplicity; and, for my part, I cannot understand how, in point of theory, any question remains. The question of the practical utility of equational or propositional expression is a different one and must be separately considered; but, in point of theory, it surely seems final to say that, if a form can be resolved into two other forms and each of these cannot further be resolved either back again into the first or into anything simpler, we have got hold of elements or what may pass for such. The proposition A is B is such an elementary form in logic and expresses an act of thought as judgment than which none simpler can be assigned. The expression A=B (all A is all B) is not elementary, because it stands for two distinct judgments at once.

From the theoretic point of view there is, moreover, another fundamental objection to the use in logic of the sign for equality. The only sense in which it can be understood, when applied to logical propositions, is, as we saw, to represent identity of the objects denoted by the terms: if understood of the attributes connoted by the terms, it does not at all express the true import of a real (synthetic) proposition. But it is precisely by their attributes—the aspect which cannot be expressed in equational form—that we *think* of things or bring them into logical relation, as Mr. Jevons allows (p. 58) when he says in language of his own (which I do not wholly adopt) that "there are many reasons for believing that the intensive or qualitative form of reasoning is the primary or fundamental one". I hold, therefore, on this ground also, that the equational form is theoretically inadmissible in logic. If, notwithstanding, Mr. Jevons is able, as we shall see, to work out with it a consistent doctrine of reasoning, this is due to the fact that connotation and denotation stand in a definite relation; and the doctrine may have its practical justification. But the theoretic difficulty remains.

We may now proceed to consider the grounds, mainly practical, upon which Mr. Jevons himself rests the credit of his doctrine with its equational base. General harmony, he contends, is established among all parts of reasoning (p. 50), and thereby a solution of the general logical problem is rendered possible (p. 105). He speaks also of Aristotle destroying "the deep analogies which bind together logical and mathematical reasoning" (p. 48), and by implication claims that his doctrine reveals them. This second point may first be shortly disposed of.

Save with the practical view of securing for logic the full use of algebraical processes, it is not clear why it should be a special object to establish analogies between logical and "mathematical" reasoning; for, if logic is the fundamental science, as Mr. Jevons triumphantly argues against Boole, there seems no meaning in seeking to do more than determine the exact logical import of mathematical, as of other scientific processes. It is clear, however, that the supposed practical advantage cannot be secured without subordinating logic to algebra. Now could there be a more effective way of throwing doubt on its fundamental character than to find that specially mathematical processes are applicable in logic? Even the use of the single sign for equality is fraught with peril in this respect, more especially as upon it depend any other "deep analogies" there may be. Whether there be analogy or not between the sign in mathematics and the copula in logic, the sign is a mathematical one and cannot be used in logic without giving to mathematics from which it is drawn a prerogative character. Mr. Jevons accordingly, for all his opposition to Boole, is not proof against the temptation to settle logical questions off-hand upon grounds of mathematical analogy; as where, for example, he urges against the doctrine of logical Conversion the usage of the mathematician who "would not think it worth mention that if $x=y$ then also $y=x$" (p. 56); obviously begging the very point in question as to the identity of subject and predicate with the terms of an algebraical equation. So much for the fundamental analogy. For the rest let us hear Mr. Jevons himself on the other side of the question. At p. 81, he tells us that originally he agreed with Boole in using the sign + for the conjunction *or* as marking logical alternation, but agrees no longer because the analogy between mathematical addition and logical alternation is "of a very partial character". Then he adds "that there is such profound difference between a logical and a mathematical term as should prevent our uniting them by the same symbol". Now I do not suppose that in this last statement, general as the wording is, Mr. Jevons is thinking of anything but the particular symbol + which he is anxious to extrude from logic; but I do not see why it does not tell with equal force against the use of the symbol =, the true fount and origin of the evil against which he finds it thus necessary to protest. In short, we have not yet got from Mr. Jevons a practical, any more than a theoretic, reason for the introduction of the fundamental symbol, and we do find him uttering a most impressive warning against a practical danger which it most naturally entails. The justification of the first step we must therefore look for elsewhere, namely, in that perfectly harmonious doctrine of reasoning which, we are led to suppose, can thus and not otherwise be developed.

The mode of reasoning first considered by Mr. Jevons, Direct Deduction, consists, as before mentioned, in Substitution practised under the one law of Identity, or, in other words, upon the premisses as given. Here, neglecting minor matters, let us at once note the points which he seeks to make against Syllogism, to the advantage of his own method. The syllogistic doctrine, he says, (1) takes no account of inferences involving Simple Identities either exclusively or along with Partials, and (2), where it is applicable, namely to Partial Identities, it draws an incomplete conclusion (p. 69), nay, sometimes even a dubious one (p. 72), while it does its work always in a clumsy incomprehensive way (p. 67), and moreover has to be supplemented by elaborate rules for the avoidance of Fallacies (p. 75). These two last heads of the second charge cannot be met without comparing in detail Mr. Jevons's plan for obviating the special doctrines of Figure and Mood and of Fallacies, and I will merely say that the attentive reader will find the simplification much more apparent than real.[1] The main charges against Syllogism one is bound to meet. For this it is important to note what Mr. Jevons means by logical conclusion or Inference. He finds it not easy to say, but at last (p. 137) commits himself to the assertion that "logical change may perhaps best be described as consisting in the determination of a relation between certain classes of objects from a relation between certain other classes". Now turn to the "inferences" as he calls them, which he charges "the ancient syllogistic system" with overlooking. Prominent among them are assertions of "equivalency of words," interchangeability of definitions and the like (pp. 62-5). But these are no inferences at all, either as understood by any serious upholder of syllogism, or, as we have just seen, by Mr. Jevons himself. It is true that amid such utterly trivial cases of verbal re-expression Mr. Jevons cites some cases of true (formal) inference from real compound assertions in the form of equations (see in particular one at the head of p. 64), but Aristotle, as already suggested, did by no means overlook such, though very rightly he did not make them fundamental in his system. As for the charge of incompleteness brought against the common syllogistic conclusion, let it be given in Mr. Jevons's own words: "From Sodium is a metal and Metals conduct electricity, we inferred that Sodium = Sodium metal conducting electricity, whereas the old logic simply concludes that Sodium conducts electricity" (p. 69). I ask which form of the conclusion best corresponds with Mr. Jevons's own definition of logical change or inference. There is some meaning in calling the common syllogistic conclusion an inference (formal): Mr. Jevons's so-called conclusion is a summing-up—a compendious description. Lastly, the still graver charge insinuated that the syllogism sometimes yields a conclusion that is open to positive misinterpretation (p. 72) has only to be looked at to fall away. From the two assertions, Potassium is a metal and Potassium floats on water, the syllogistic conclusion is that Some metal floats on water. Mr. Jevons objects that some metal (or, as he writes it, metals) is here liable to be understood too widely, when in fact all you can be sure of from the premisses is that the one metal potassium floats. But he ought to remember that *some* in logic means *not-none* and that only. How can it then be understood here too widely? In what respect is the conclusion not perfectly exact? His own expression Potassium metal = Potassium floating on water, if it can seriously be called a conclusion at all, is not a whit more safe against misinterpretation. Because it does not prove that gold will not float, anybody who cares may stoutly maintain that gold perhaps may. Logic is not meant nor has any power to bar out wilful irrelevancies.

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[1] The reader will also find some wholly misdirected argument on p. 76, where Mr. Jevons contests the universality of the rule that two negative premisses yield no conclusion. The example he urges by way of exception is no exception. There are *four* terms in the example, and thus no syllogism, if the premisses are taken as negative propositions; while the minor premiss is an *affirmative* proposition, if the terms are made of the requisite number three.

So much for Direct Deduction. It is however in the Indirect Method of Inference that Mr. Jevons's doctrine culminates, affording that solution of the general problem of logic which is the true mark of its superiority. Unfortunately it is just at this stage that it becomes impossible to give in brief form a satisfactory statement of the doctrine as a basis for criticism: Mr. Jevons himself without wasting words takes not a few pages to expound the method fully. The method reposes ultimately on the fact that, under the law of Excluded Middle, anything in logic may be expressed in terms of anything else—in the form, namely, of the disjunctive propositions A is either B or not-B. Conceive then a set of premisses involving several terms (two, three, four, &c.): what possible alternative combinations of the terms there are, without reference to the premisses, may always be fixedly determined, and what particular combinations are possible with reference to, or consistently with, the premisses may then be determined by a process of substitution followed by an application of the law of Contradiction. Those to whom this statement is obscure must go to the book itself, where they will see the whole method not only clearly set forth and copiously illustrated, but gradually brought into such a shape that the machine devised by Mr. Jevons does the purely logical part of the whole process.

It should in any case be evident why Mr. Jevons lays particular stress upon the relation of Disjunction or Alternation and devotes a special chapter to it, though some may wonder why in a theory of pure logic he takes no express account of the relation of Reason and Consequent in hypothetical propositions, upon which disjunctives have hitherto generally been supposed to depend. As it stands, the chapter on Disjunctive Propositions contains much that is of value. Mr. Jevons argues strongly for the view maintained by some logicians (Whately, Mansel, Mill, &c.), against others (Hamilton, Boole, &c.), that *either-or* does not mean *if the one then not the other* but only *if not the one then the other*. Without adopting all his arguments (for here as elsewhere he does not distinguish sufficiently between mere verbal expression and real thought) one can agree with his conclusion so far as to say that logical alternation does not universally mean more than is conveyed by the second of the two hypothetical expressions. It is not clear, however, why Mr. Jevons should argue so elaborately for his conclusion. The alternation he has in view for the development of logical terms under the law of Excluded Middle, as in A is either B or not-B, is one where the alternatives are mutually exclusive; and in no other sense of Alternation can he describe it (which he does at the beginning of the chapter) as a process equal to that otherwise known as logical Division—the inverse process to Generalisation.[1] All this, however, by the way.

What, then, shall be said of the Indirect Method itself? Undoubtedly it does accomplish all that Mr. Jevons claims for it; and that he has sought not without success for a method which shall solve the problem of logic generally is a merit of which no criticism can rob him. One may hold the method to be artificial and demur to its theoretic base; nevertheless it does what it professes to do, does it more simply and satisfactorily than previous systems (like Boole's) that made the same professions, and *apparently* it does what the traditional system of logic cannot do. Whatever may be said in favour of the bases of the traditional system, it cannot be denied that its supporters have shown the most persistent indisposition to develop it into an effective universal method of reasoning. It has been passed on from century to century in a crystallised form; it appears to admit of no development—nay, the boast has been made (though ignorantly) that it was completed once for all by Aristotle; and practical influence over reasoning, except within a certain narrow range, it seems to have none. For all that appears, the adherent of the old logic gets little or no benefit from his science the moment an argument becomes truly complex and passes beyond a small number of rigid forms. No wonder that earnest logicians like Mr. Jevons, anxious for a truly general theory, should be tempted to break away from a system that has proved so barren, and grasp at analogies that may procure for the theory of reasoning something of the pliability and fruitfulness belonging to the science of mathematics. The temptation granted, it cannot be too often repeated that Mr. Jevons has signalised himself above other innovators in devising a system that is practically effective without sacrificing (like Boole's) the independence of Logic altogether.

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[1] Mr. Jevons says Abstraction (p. 79), but this must be a slip. The inverse of Abstraction is not Division but the well-recognised process of Determination.

At the same time it may well be doubted whether Mr. Jevons would not have done better, if, instead of reconstructing logic from its foundation, he had entered into the spirit of the older system, and, seeing it to be theoretically sound, had indulged his scientific ardour in developing that system so as to make it practically fruitful and useful. All the criticism which it is here possible for me to make upon his crowning Indirect Method is, that I believe it would have cost far less trouble to develop the traditional doctrine to meet the cases of complex reasoning he has in view than to devise a brand-new system to the confusion of Aristotle. It is a case where one must have regard equally to soundness of theoretic principle and to ease of practical application. In the foregoing remarks it has been urged in various ways that the older logic is theoretically sound in its bases and that Mr. Jevons's system is theoretically unsound.

How shall one decide between them on the other count of practical utility? Would it be unfair to take the most complex instances of reasoning which Mr. Jevons cites as high triumphs—the highest he gives—of his method, and, if one could show that they are more easily solved by the old logic properly interpreted, then infer that even on the practical side the new system is inferior? It would not be a decisive test, for Mr. Jevons might bring forward still more complex problems which one knows not beforehand if one could resolve: but at all events it would not be unfair, nor for that matter undecisive against Mr. Jevons as he appears deliberately in his book. Well then! I affirm that the most complex problems there solved up to those on p. 117 can, as special logical questions, be more easily and shortly dealt with upon the principles and with the recognised methods of the traditional logic; and till I have cases put before me where this doctrine proves to be practically impotent, I am bound, in consideration of its clear theoretic superiority, to prefer it to the system, however ingenious, of Mr. Jevons.[1]

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[1] Take his last and most complex example: "Every A is one only of the two B or C, D is both B and C except when B is E and then it is neither; therefore no A is D". Here the mention of E *as* E has no bearing on the special conclusion A is not D and may be dropt, while the implication is kept in view; otherwise, for simplification, let BC stand for "both B and C," and *bc* for "neither B nor C". The premisses then are

(1) D is either BC or *bc*,
(2) A is neither BC nor *bc*,

which is a well-recognised form of Dilemma with conclusion A is not D. Or, by expressing (2) as A is-not either BC or *bc*, the conclusion may be got in Camestres. The reader may compare Mr. Jevons's procedure on p. 117. If it be objected that we have here by the traditional processes got only a special conclusion, it is a sufficient reply that any conclusion by itself must be special. What other conclusion from these premisses is the common logic powerless to obtain?

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PHILOSOPHY IN LONDON.[1]

THE readers of this journal have now had set before them reports on the past and present state of philosophical study at the ancient English universities, and at the younger but still venerable sister-university of Dublin. There are other academic seats in the country that have a history of philosophical achievement, and are now active towards issues which it is important to understand. But in the present series of articles there may be some advantage if, before passing to the Scottish universities, and thence extending the survey abroad, attention is drawn to the state of philosophical study in London, which is itself the seat of a university, and one moreover that has been called into being within the last half-century expressly to meet the wants of these days.

London is the seat of a university, yet one can hardly speak of philosophy *at* London as *at* Oxford, Cambridge or Dublin; and why? Its mere size, vast beyond comparison though it be, need not keep it from being identified with a university, when other great capitals are rendered illustrious by nothing more than their academic fame. Nor is it necessary that a university should have sprung up in a bygone age to become the genius of the place: the University of Berlin is but a few years older than the University of London. Rather must the reason be sought in some special disproportion between this university and its metropolitan seat.

The University does indeed occupy no very prominent position in London. An examining board which does its work, for the most part, out of all relation to such instruction as the place affords, cannot, whatever its merits may be, play the part of a great informing power whose influence is felt throughout the whole intellectual life of the place.

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[1] *Mind*, i. 531.

Merits the University assuredly has, and not least as regards the encouragement of philosophical study, but they avail nothing to bring it into prominence in the world of London. What it accomplishes it does for the remotest corners of the country, nay, for the very ends of the earth, as much as for London; and let who will make light of an influence so wide. Yet, if it accomplishes for London nothing more than for the ends of the earth, one sees perhaps how it may bear its name in vain—how the higher education in London itself may be starved for the benefit of unattached learners up and down the country or the alien.

The University of London, now fixed in Burlington Gardens, was not the first bearer of the name. The title was originally assumed by a different institution, which, projected in 1825, and established in the imposing building in Gower Street before the end of 1828, was finally constituted under its present name of University College in the same year, 1836, that first saw a university founded in the metropolis with the legal privilege of conferring degrees. The original (self-styled) London University was meant to be a university in the Scottish or German sense. Being designed in the first instance for the education of those who by reason of religious restrictions or otherwise were excluded from Oxford and Cambridge, it naturally looked elsewhere for its model. The instruction, duly supplemented by written and oral examinations, was to be given by public professorial lectures, in place of the tutorial system predominant at the older universities. On the other hand, it was far removed from that notion of a university which time and circumstances have actually realised in London. It was to be first and foremost a place of instruction in all the higher departments of knowledge—a true centre of enlightenment befitting the greatness of the capital. The degrees which it hoped to obtain the right to confer were to be given in relation to instruction only. At the same time its scheme of instruction bore one distinctive feature. It was not only, like some other universities (the German and, practically, the Scottish), to assume no charge of the religious education of its students, leaving this to their natural guardians, but it was to have no theological department of instruction. There was no need, its projectors thought, to undertake a function as regarded the Established Church that was more than provided for at Oxford and Cambridge, and there was no possibility of devising a common system of theological instruction for the variety of sects that would be its first constituents, or for the variety of races that might be attracted to a metropolitan seat of learning. The very circumstances and conditions that necessitated the founding of a new seat of superior instruction for whole classes of the community cut off from all chance of higher culture, seemed to impose the exclusion of theology from the scheme.

The claims of Philosophy as a means of liberal education were least likely to be overlooked, for among the founders of the new institution were James Mill and Grote, then a young man much under the influence of the elder thinker. In the first *Statement*, issued in 1827, respecting the nature and objects of the foundation, there were announced among the professorships to be instituted one of Logic and Philosophy of the Human Mind, and one of Moral and Political Philosophy (besides a chair of Political Economy). "As the Physical Sciences aim at ascertaining the most general facts observed by sense in the things which are the objects of thought, so the Mental Sciences seek to determine the most general facts relating to thought or feeling, which are made known to the being who thinks by his own consciousness;" and the *Statement* goes on to explain how, though "the subdivision of this part of knowledge would be very desirable on account of its importance and intricacy," it would in the first instance be provided for by the chair of Logic, while the chair of Moral (and Political) Philosophy would deal with Ethics as distinguished from the other moral science of Jurisprudence which would also claim the attention of the general student. A *Second Statement* (1828), explaining in great detail the plan of instruction to be followed in the University, declares in relation to the two professorships that, though the names Logic and Moral Philosophy "are neither correctly indicative of the parts of learning to be expressed by them, nor is such a distribution of the subject thereby effected as strict science would demand, the Council have deemed it better to adopt them because known and received, than to venture upon others which, if they were less imperfect, would probably, because more strange, be less acceptable". "The Logic Class will have for its province that department of mental phenomena in which all that relates to knowledge or the acquisition and formation of ideas is concerned. The Moral Philosophy Class will have for its province that department of the mental phenomena in which all that relates to action is concerned; or, more properly speaking, those peculiar states of mind which are the immediate antecedents of our actions, and from which we therefore say that our actions proceed." It was added that as in these classes the youthful mind was introduced for the first time to the great mental processes of Generalisation and Abstraction, there was "more than usual occasion for constant examination, for the frequent prescription of written exercises, and for all the operations of that active study which more speedily imparts a mastery over a new set of ideas than passively listening to a lecture or perusing a book"; accordingly, a more than usual portion of time would be set apart for those purposes. No less than two hours (one for examination, &c.) every day were to be given to Logic and Philosophy of the Human Mind in the student's third year (along with Chemistry and Natural Philosophy), and nearly as much time to Moral and Political Philosophy in the fourth year (along with Jurisprudence, Political Economy and Natural Philosophy). There are those who will be interested to read of so serious a scheme of philosophical instruction being at that time propounded in London, and I have therefore quoted from the *Statements* at some length—all the more because the scheme was one that in the event did not find favour with the Fates. In making the appointment to the chair of Philosophy of Mind and Logic (as later it came to be called), differences of opinion revealed themselves within the Council which kept it unfilled till 1830, when it was assigned to the Rev. John Hoppus, a follower of Thomas Brown in philosophy, who continued to hold it till 1866 in the teeth of circumstances that could hardly have been more adverse to the cause of philosophical study. The chair of Moral and Political Philosophy has never been filled to this day.

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The scheme of philosophical instruction did in truth only share the evil destiny reserved for the whole project to establish in London a true seat of academic influence. It was certainly no mean intelligence that dictated the lines of the project, as any one may yet see who will read the remarkable *Statements* issued by the Council of the new institution; and at first everything promised well. The founders, if they underrated the natural obstacles in the way, had some reason for indulging in their hopeful, not to say sanguine, visions of success. The proverbial schoolmaster was then fairly abroad, and there was need of the professor to finish his work. Nor was there wanting to the projected London University the countenance of some in the highest place, and of more who were marked out for power in the coming days of political reform. A sum which reached the figure of £160,000 was quickly subscribed for the rearing of an appropriate edifice and for the due equipment of an instructing staff, which included some of the most distinguished names of the day in literature and science. And yet the project failed to make way. It roused the bitterest political resentment because there were Radicals among its founders, and unmeasured scorn was poured on it because it counted on support from the religious dissenters. The exclusion of theology, however anxiously explained to be inevitable, of course meant a godless institution, and straightway its foes were moved to establish another seat of superior instruction in London, of which theology should be the corner-stone. Hardly had the so-called University opened its gates in Gower Street, when King's College was set up as a rival in the Strand; and London, which till then had been devoid of the means of higher education, found itself all of a sudden provided not with one academic institution but with two. Political and religious contention could in a year overdo what centuries had left undone. The young institution was from the first prevented from becoming the great metropolitan centre of instruction which was the main part of its design; and, in as far as it aimed at securing the legal status of a university with degree-conferring powers, it was doomed to be still more effectually thwarted. The Universities of Oxford and Cambridge would not do the work it was struggling into being to perform, but they could stoop to crush the semblance of a rival. When the Government (even after the foundation of King's College) was on the point of granting a university-charter in 1830, it had to be dropped at the last stage, just before passing the Great Seal, because Oxford objected to the liberty of conferring degrees in arts, and Cambridge would not hear of degrees being granted at all. Again moved for about two years later, the grant of a charter was again opposed by the same jealous influences, as also (with more reason) by the medical corporations and schools in London. To obviate the opposition of these last the claim to give medical degrees was surrendered, and the House of Commons in the first reformed Parliament (1833) supported the petition as regarded degrees in arts and laws by a great majority. The Government, however, though not unfriendly, was in a real difficulty by reason of the existence of King's College, which could not be left out of account while it could neither be merged with the "London University" nor incorporated separately with full academic privileges. The only course that seemed open was to create a university over the heads of both institutions, which should have the sole duty of examining while they should have the sole function of giving instruction. In this sense accordingly a resolution was taken, and the University of London was formally constituted in 1836, the parent-institution being at the same time regularly incorporated as University College. The exclusion of theology from the University as finally constituted gave authoritative sanction to the principles that had guided the original movers in their single-minded effort to found in London a home of the higher learning befitting the capital of the country; and it was with the hope of seeing their dream after all realised that they accepted without a grudge for their costly institution a secondary rank in the academic system. In point of fact, it was still possible that a University in the fullest sense should grow up in London between the new examining board with its State-privileges on the one hand and the two Colleges as they might be developed on the other. But, while nothing more was done either by the State or by private munificence to support and develop the instruction of the Colleges, it had been provided in the charter of the University that other institutions in or *out of* London might be affiliated to it, and this provision lay so little dormant that in the next twenty years a host of colleges and secondary schools scattered through the country acquired an equal right with the metropolitan Colleges to send up candidates for examination. There was then an end of the dream. The University might or might not have a useful work to do in the country, and might or might not do it; but it could never more hope to sway the intellectual life of London.

Such as it was during those twenty years, the University of London did by its system of examinations do something to bring forward Philosophy as a subject of study. Every candidate for the B.A. degree was required to pass in Logic and Moral Philosophy, and a man's position here was taken into account in determining the honours-list in classics and mathematics. The higher degree of M.A. might be obtained by a special line of study which consisted of Logic, Moral Philosophy, Philosophy of the Mind, Political Philosophy and Political Economy. Further, the noteworthy regulation was enforced from the beginning that Doctors in Medicine should pass an examination in the Elements of Intellectual Philosophy, Logic and Moral Philosophy, unless they had previously taken a degree in arts. The actual requirements, however, within this scheme were trifling enough. Bachelors of Arts were expected only to have read part of Whately's *Logic*, and, in Moral Philosophy, part of Paley's treatise, with Butler's three Sermons on Human Nature. For the degree of M.D., the examination, at first left open to the discretion of the examiners, came in time to turn upon the first book of the *Novum Organum*, Cousin's *Analysis of Locke's Essay*, the first part of Butler's *Analogy*, and Stewart's *Outlines of Moral Philosophy* (not so mean a prescription of its kind). The M.A. examination remained nominally open, but from the years 1842-3 onwards till 1857 the examiners, Mr. T. Burcham, a police magistrate (who also did duty in classics), and the Rev. Henry Alford, afterwards Dean of Canterbury, were never changed—with the natural result as regards range of topics. The effect upon instruction as given in the metropolitan Colleges may easily be understood. No candidate preparing for the B.A. degree from University College had the least occasion to attend the professor's lectures on Philosophy of Mind and Logic, and accordingly the professor, having no hold upon the only auditors on whom he might regularly count, lectured during all those years to very thinly covered benches. King's College, which had started without any chair of Philosophy and obviously set much less store by the subject, was not moved now to acquire an interest in it, and went on without any means of philosophical instruction.

No change of any importance was made in the system of philosophical examinations as at first constituted, till under the new charter (9th April, 1858) the decisive alteration in the status of the University was consummated, whereby it was cut loose from all connexion (except in the medical department) with particular places of instruction, metropolitan or other. While the question of the new constitution was still pending, in 1857, the examiners in Logic and Moral Philosophy, Messrs. Bain and Spencer Baynes, then newly appointed in place of the two who had acted together for so many years, addressed a formal representation to the Senate on the state of the examinations and submitted a very different scheme, which, with some amendments, was finally adopted at the end of 1858 and has since remained in force without further change, except as it was made to apply to the degrees in Science instituted in 1859. By this time Mr. Grote, having brought his History to a close, had become one of the most active members of the Senate (which he joined in 1850), and his interest in Philosophy, always great yet growing ever stronger with his years, led him to take special charge of the proposed scheme so long as it remained under discussion. As the University was about to admit all comers to its examinations, it was important, while substituting a scheme of reasonable extent in place of the old one, so to frame it as to encourage a resort to systematic instruction; and to this end it seemed the most effective course to prescribe no particular books but simply to indicate, as the new examiners proposed, a range of topics representing the main divisions of progressive philosophical inquiry.

The scheme propounded, and at first designed to bear the new title of "Logic and *Mental* Philosophy," was however vehemently opposed by some of the affiliated Roman Catholic Colleges on the ground that Mental Philosophy (embracing, as was stated, the Senses, the Intellect and the Will) was a department of knowledge little less vexed by polemics than theology itself, so that the examiners for the time being would be made judges of philosophical orthodoxy; and also on the ground that, even if no such evil result ensued as the propagation of a system and the creation of a London University school of Philosophy, yet Catholic students would be placed at a disadvantage, being precluded from the study of modern psychological theories till an advanced period of their course, after they were indoctrinated in the body of philosophical truth ancillary to the Theology of the Church (*Minutes of the Senate*, 1858, p. 87). It was implied, if not expressly asserted, that the previous scheme, prescribing some parts of Whately, &c., was unobjectionable—probably because of its triviality. The *Minutes* (Dec. 15, 1858) contain a very remarkable statement penned by Mr. Grote in reply to the objections; and what he urged against the notion of the least design to impose with the weight of University authority a particular view of philosophical orthodoxy, has certainly been borne out by the selection of examiners (no one of whom can serve more than five years running) from that time to the present. Professor Spencer Baynes, one of the present two examiners, has been as much in favour with the Senate as Professor Bain, and the others, in order of appointment, have been the late Professor Ferrier, Mr. Poste, the present writer, the Rector of Lincoln, Mr. Venn and now Professor Jevons.

The principle of the scheme of examinations in Logic and Moral Philosophy (the old title being in the end retained), as it came into full working order from the year 1860, is a very intelligible one. A minimum requirement for the degree of Bachelor of Arts, or of Science, is variously extended and intensified for the grade of Bachelor with Honour, and for the higher degrees of M.A. and D.Sc., while it is (in practice) somewhat attenuated for the professional degree of Doctor of Medicine or Master of Surgery. The University of

London exacts a certain amount of philosophical knowledge from every Bachelor of Arts as part of a general liberal education, and from every Bachelor of Science as part of his general scientific equipment. "Names, Notions and Propositions, Syllogism, Induction and subsidiary operations" mark with sufficient plainness the scope of the examination in Logic; and the heads "Senses, Intellect and Will, including the Theory of Moral Obligation" show that Moral Philosophy is understood in the wider sense of Mental Philosophy, while this last is interpreted chiefly as Psychology. Bachelors, whether of Arts or Science, may thereupon subject themselves to a more protracted (two days instead of one) and severer trial in the same subjects, supplemented by the topic of "Emotions," and with the "Theory of Ethics" brought into greater prominence: a scholarship of £50 for three years may here be gained. The Bachelor of Arts who now proceeds (after not less than eight months) to the special degree of Master will, if he chooses Branch III., be subjected (for three days) to examination in the old topics (only Ethical *Systems* instead of *Theory*) supplemented by a special prescription, varied every year, in Political Philosophy and History of Philosophy,[1] besides Political Economy (one day): here may be won a gold medal worth £20. The still more special degree of Doctor of Science, open only to Bachelors of Science of not less than two years' standing, may be taken in "Mental Science," with the main topics as for M.A. set out as principal subject, and the following as subsidiary subjects—"Physiology of the Nervous System and Organs of the Senses in man and other animals, History of Philosophy, Political Philosophy, and Political Economy" (in all four days): "a thorough practical knowledge of the principal subject and a general acquaintance with the subsidiary subjects" is here required. Finally the degree of M.D. or M.S. cannot be obtained without a philosophical examination (three hours), of which the nominal scope coincides with that for the B.A. or B.Sc. degrees, though there is a tacit understanding that those aspects of the subjects should chiefly be considered that are least remote from the field of medical practice.

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[1] For 1876 the subjects were: Political Philosophy—Ideal Polities or States, their nature and use, with special reference to Plato's *Republic*, More's *Utopia*, and Bacon's *New Atlantis*; History of Philosophy—The development of Locke's principles, Berkeley's *Principles of Human Knowledge* and Hume's *Treatise of Human Nature*.

The scheme, it will hardly be denied, is not only clearly conceived but betokens a real concern for the promotion of philosophical study and work. That philosophy should form part of every liberal education (B.A.), and that it may then well engage the special attention of more advanced students (M.A.) before taking up with a particular profession; that Psychology and Logic have their place in a general scientific discipline (B.Sc.), and that mental research in one or other of its departments may claim the life-long devotion of trained scientific powers (D.Sc.); lastly, that every medical man who aspires to the higher dignities of his profession (M.D., M.S.) should have bestowed some express thought on the laws of evidence and on the hidden mental life inwoven with the bodily frame—such is the meaning of the scheme; and where is there another university that makes so systematic a stand for the cause of philosophy in education? It should not be forgotten that even in the early years of the University the importance of the subject had been, in name at least, recognised, in deference, it may be supposed, to the principles of the original movers for university-education in London; and thus it was easier for an earnest friend of philosophical study like Mr. Grote, himself one of them, to get the reformed scheme in its completeness set on foot when the new constitution imposed upon the Senate the duty of making the examinations at once broad and effective. On looking, however, beyond the scheme itself to its actual working, there seems less ground for satisfaction, and the reason will perhaps be found to lie in that very peculiarity of constitution with reference to which the scheme was so carefully devised. The Senate would no longer require of candidates for degrees that they should have been instructed in particular colleges; but it hardly expected that a great proportion of them would cease to frequent any place of instruction. It started with an earnest determination to maintain a high standard of requirement: it did not foresee that away from a base of instruction the standard could be neither constant nor high.

It was certainly from no desire to discourage systematic instruction that the more enlightened members of the Senate stood by the plan of opening the University examinations to all comers in the teeth of strong remonstrance from all the more important affiliated colleges. With affiliation carried out as it had been in the first twenty years, the truth was that no shadow of reason remained for excluding almost any decent secondary school from the list of the institutions whence the University received certificates for degrees in arts and laws; and the only sensible step forward, when there was no question of taking a great many steps backward to the original position of founding in reality as in name a University of London, was of course to admit candidates without reference to their place of instruction. This had become clear, not only to the majority of the Senate, who from one motive or another had gone on relaxing the conditions of affiliation, but also to those members (like Mr. Grote) who had struggled in vain for the maintenance of stricter principles; and the step once fairly contemplated, there was no stopping short of the final position that the University should confine itself to its own work of examining, whether or not candidates had been regularly instructed at all. It all followed as naturally as possible from the University being set up, not as a means of organising the higher instruction in the capital, but to perform directly a certain useful kind of work for the country at large. At the same time the notion of fair and open examination for all with perfect free-trade in teaching had an air of liberalism about it that imposed on many minds, as it still is the idol of Mr. Lowe; and it was only to be expected that some ardent advocate should urge what lustre would be shed on the University that welcomed to its examinations "the heroic stonemason," beholden to no college whatever for instruction. Nevertheless, as I have said, the intention of the best heads was rather to encourage than depress instruction, and as regards the initial (B.A. and B.Sc.) examination in Philosophy it was even expressly intimated that the amount of acquirement expected was such as might fairly be attained by a course of instruction in a class during the year preceding examination. It is interesting then to see what kind of philosophical study the scheme of the University has in practice evoked during the last fifteen years.

The broad result is that a full half of the yearly tale of Bachelors of Arts (to take the most representative class of graduates) acquire their knowledge of philosophy by private reading without instruction, while the proportion of such private students to the whole number of candidates for examination is considerably greater. Of the others who pass as Bachelors, some ten or twelve may have had more or less of formal instruction in Catholic or Dissenting theological colleges, and the rest are students of the only two general academic institutions that remain in any sort of regular connexion with the University, namely, University College, which sends up yearly about a dozen men, and Owens College, Manchester, whose usual quota is less than half as many. (King's College, which still does not include Philosophy in its scheme of instruction, has practically ceased to maintain any relations with the University of which it was to be a chief feeder.) Now the number of students who go up from University College shows no tendency to increase, and the authorities of Owens College have just made it part of their plea for being turned into an independent university that fewer and fewer of their instructed students care to look to the London examinations. Some serious questions thereupon arise. What is the effect on the philosophical examinations of the unexpected predominance of private-study candidates? And what is the real value of the carefully elaborated scheme for candidates of that class? I am afraid it must be answered that, in such circumstances, an examination tends to become whatever test a fair proportion of candidates for the time being are found able to pass. Nobody is to blame, and yet it is so. The authorities may be sincerely anxious to maintain a good standard, the examiners may set the most carefully considered papers; all the same, when the list of the rejected comes to be determined, it is not in human nature not to take account of the actual performance of the bulk of the candidates and accommodate the standard to the exigencies of the occasion. Then the candidates, in course of time, discover that certain books most nearly correspond with the scope of the examination, and the examiners, however careful they may be to put open questions, cannot refuse a stereotyped form of answer or bear hard on those candidates whose obviously limited reading has left them without the means of answering any but a determinate class of questions. Thus practically the examination comes to turn upon books after all; and the formal divorce of the University from any system of instruction leaves it to be supposed that the reading of one or two philosophical books constitutes an effective mental discipline. But nothing could be more fallacious. I doubt if any one who has read the written answers of the multifarious crowd of candidates for the B.A. degree, the majority of whom have come into contact with no living instructor, can hold it an unmixed good that an examination in Philosophy is imposed upon all under the present constitution of the University. The subject, so nearly concerning every reflective human mind, and most fitly therefore regarded as crowning a liberal education, is yet the one of all others that may least be left to undirected private reading in the case of the mass of students. Certainly there are a few minds here and there, now and again, who with or without formal instruction follow a native bent and can be trusted to work their way to clearness and coherence of thought on the questions of human origin and destiny, but with the multitude of learners it is quite otherwise. A little book knowledge of philosophical questions, when not a dangerous, is truly a most unprofitable thing. That general students may profit by a course of philosophical instruction there is the experience of the Scottish Universities to show; and the number of distinguished thinkers who have risen in the ranks of Scottish professors represents a real national gain yielded by an organised system of public instruction in Philosophy. It is to be charged against the London University that all its elaborate machinery does nothing to help on the work of instruction, but rather has the contrary effect as regards the higher elements of human culture. At least as respects Philosophy, while it is certain that Grote and others looked forward to a great development of instruction, the advance made in the last fifteen years has been quite insignificant.

University College has its professor of Philosophy of Mind and Logic who lectures year after year to a small voluntary class of young students attending the College, with a few additional hearers from without, but has no constituency to draw upon for higher work in the subjects, because candidates for the special degree of M.A. at the University are a handful altogether in any year, and, besides, are scattered through the country, or, if in London, are generally engaged already in some active pursuit interfering with continuous study. Owens College in Manchester has a professor who as yet at least is in no more favourable position as regards auditors, while he is weighted with the additional subject of political economy. Besides these two there is no other public professor of Philosophy in all England outside of Oxford and Cambridge. Such instruction as is given in some Dissenting theological colleges or in Catholic colleges is of course discounted, though it should not be forgotten that one theological seminary in London has long been signalised by the teaching of Mr. Martineau. The statement whether as regards the country or as regards London will sound incredible to foreign ears, and may astonish even English readers when presented in its nakedness. Meanwhile the old Universities, as the readers of this journal have been told on the best authority, do not come near to discharging the national work that is otherwise left undone; however great be the credit due to the band of earnest instructors who are labouring to establish a due balance of education at Cambridge by the revival of Philosophy, or whatever be the evidence of serious thinking at Oxford at a level high above the arena of the examination-schools. One can only hope for a day to come when in London some organised system of highest instruction will supersede the wasteful efforts of rival institutions now ill-equipped or incomplete, and trust that in that day the importance of Philosophy as a mediating influence between letters and science will be fully recognised. How the reform may be brought to pass, there is little as yet to show. Perhaps the University of London, having done a good work in stirring up the country to a sense of the need of broad secondary education, will after all be transformed, for the good of the country's capital, into the likeness of that original seat of high learning which was projected to bear the name; taking up into one coherent academic system the two Colleges that sprang out of the first movement and the special scientific schools that, by a lavish appropriation of public money, have in later years been founded without the least regard to the private sacrifices made half a century ago. Perhaps University College itself, as the original depositary of the academic trust for London, will, after its long struggle with faint success to make the higher education self-supporting, receive from public or private sources the endowment that all human experience has proved to be indispensable for its maintenance, and will expand into a great school of all science and learning that need not look outside to the cramping standard of even the best examining body that is nothing else. In one way or another the reproach that adheres to superior instruction in London and to philosophical instruction with the rest cannot too soon be taken away.[1]

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[1] Within the last few months a Society has actually been formed with the professed object of organising University Education in London, and as, in the view of the foregoing article, the question of philosophical instruction is bound up with the larger problem, a word or two upon the latest attempt to solve it may not be out of place. The Society has arisen out of a movement by one or two meritorious institutions that give instruction in the evening to persons engaged in business by day. These were desirous to obtain the services of young Cambridge lecturers like those who in late years have been breaking ground in northern towns; but oddly enough, the humble design was given out as the beginning of a scheme for University Education in the metropolis, as if such a thing had never before been thought of, and London were another Nottingham upon which a reflexion of academic light might be induced to fall. Soon, however, the movers and their influential friends, some of whom were less ignorant than forgetful of what had been done in former days, awoke to a sense of the difference between London and a provincial town, and the scheme then took a new shape. The notion was now to invoke the two older Universities with the University of London to take the metropolitan field in charge with the view of supplementing the instruction already given within it, and a very elaborate working-plan was devised. But as Oxford and Cambridge have since declined the proffered charge, the Society is left to make what way it can within London itself.

One desires to speak with all respect of any serious effort directed towards the end proposed, and there has undoubtedly been no small energy displayed in the establishment of this Society. The observation cannot however be forborne that its founders have from the first kept before them no distinct conception of what is meant by University Education. If their main object, as there is still some reason to suppose, is to provide additional evening instruction in different parts of London, the name of University Education is surely misapplied. If, on the other hand, it be true academic work which they are eager to foster, the simplest way, one would think, is to develop the two Colleges that have struggled to maintain the higher learning for nearly fifty years past. But it would seem as if in London there were never to be an end of new beginnings.

Supplementary Note.—For an important change (of principle) in the B.Sc. regulations, just announced, see *News* at the end of this number.

Since the article on *Philosophy in London* in the present number was written, an important change has been announced in the plan of examinations for the degree of Bachelor of Science in the University, whereby Logic and Psychology will cease to be compulsory subjects; and thus vanishes one of the most characteristic features of the general scheme of the University as set forth in the article. The B.Sc. examination will as before consist of two stages, but will not henceforth have reference to a merely *general* discipline in the sciences. At the second stage, instead of being required as heretofore to pass in five different subjects making with the four subjects of the first stage a tolerably complete round of the chief sciences, a candidate in future need not bring up more than three out of nine subjects, of which Logic and Psychology form one. That is to say, he will begin to *specialise* before reaching the grade of Bachelor. Care, however, is taken to make the earlier examination more comprehensive than hitherto—in fact, fairly co-extensive with the field of general science as commonly understood. The practical and other reasons for the change are very strong, nor is it greatly to be regretted, in the present state of instruction or feeling about instruction as described in the article, that the philosophical examination will no longer be imposed on all the candidates. At the same time it is right to point out that the general scheme of the University is dislocated by giving the B.Sc. degree (even partially) a special character; while if Logic and Psychology are allowed (as they are) to rank as Science, they cannot properly be ranged (as they are) with departments so special—not to say concrete—as botany, zoology, or physical geography and geology. About Psychology there may be a question, if it is not clearly conceived as the great fundamental subjective science—the root of one half of human knowledge, or rather, the key to one whole side of all human knowledge; but surely Logic at least pertains to the most general scientific discipline. In no longer requiring a knowledge of Logic from its Bachelors of Science, the University is throwing away one of its chief distinctions, and will not so easily replace or recover it.

No change has been made in the regulations for admission to the degree of D.Sc., except that candidates who have prolonged the interval between the first and second stages of the B.Sc. examination from one year to two years or more, over their special studies, may go up for the Doctorate after a single year instead of two years as before. This change seems a reasonable one in the new circumstances; but the reform really called for in the D.Sc. regulations is that some evidence of original work should be required from the candidates, by way of written dissertation or otherwise. In the department of Mental Science at least, the written answers to papers of miscellaneous questions which are at present the only test imposed, keep the degree practically at the level of the ordinary M.A. (Branch III.), except in so far as the greater range of subjects implies a longer and wider study. But this very width of range – extending from

Physiology of the Nervous System through Mental Philosophy (in all its branches) to Political Philosophy—is itself a grievance. When a man has begun to specialise to any purpose, he will find in any one of the subjects indicated occupation enough—supposing that "a thorough practical knowledge" is by all available means exacted. It is doubtless because of the extreme width of the range of the examination that in all the last sixteen years since the degree was instituted, no more than two candidates have presented themselves for the Doctorate in Mental Science. One of them, Mr. P. K. Ráy, a native of Bengal, has this year succeeded in passing, but such a result is hardly a sufficient justification of the present examination-scheme.

THE LOGIC OF "IF".[1]

I HAVE lately come across a passage in *Clarissa Harlowe* where Richardson indicates with great clearness a distinction which has long seemed to me to be overlooked by logicians in their treatment of Hypothetical Syllogism. It is in the admirable scene where Morden and Lovelace are first brought together, and runs thus: Morden: "But *if* you have the value for my cousin that you say you have, you must needs think——" Lovelace: "You must allow me, sir, to interrupt you. *If* I have the value I *say* I have. I hope, sir, when I *say* I have that value, there is no cause for that *if*, as you pronounced it with an emphasis." Morden: "Had you heard me out, Mr. Lovelace, you would have found that my *if* was rather an *if* of inference than of doubt."

The question has been much debated among logicians whether the so-called Hypothetical Syllogism of this type

If A is B, C is D
But A is B
∴ C is D

is a *mediate* inference like the common Categorical Syllogism, or whether the conclusion is not *immediately* drawn from the one premiss 'If A is B, C is D'. Prof. Bain, for example (*Logic*, i. 116), would deny that the reasoning is mediate, and the reader may consult his work for a short summary of the different arguments urged by Mansel and other distinguished logicians on the same side of the question. Some of the arguments, indeed, are too plainly defective, as when Mansel declares that in the Hypothetical Syllogism "the minor (A is B) and the conclusion (C is D) indifferently change places and each of them is merely one of the two members constituting the major"—which is not the case in Categorical Syllogism. Here he commits a very great blunder, since it is notorious that 'A is B' cannot be got as a conclusion with 'C is D' as second premiss. However, the whole weight of authority in favour of the inference being *immediate* is undoubtedly great, and if one takes the other view, some explanation must be found for the strong array of opinion that may be cited against it.

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[1] *Mind*, ii. 264.

It seems obvious enough that when the proposition 'If A is B, C is D' is uttered as a pure hypothesis—the *if*, as Richardson expresses it, being one of *doubt*—it is not possible to pass directly to the assertion that 'C *is* D'. This can be reached only through the other assertion 'A *is* B'; and what is the reasoning then but *mediate?* If the conclusion, which is quite a different proposition from the original datum, is here not mediately reached, there is no such thing as mediate reasoning in categoricals. Whatever meaning there is in saying that given 'M is P,' we arrive at the different proposition 'S is P' only mediately—through 'S is M,' there is as much meaning in saying the like of 'C is D' obtained as a positive assertion from the supposition 'If A is B, C is D' only *through* the positive assertion 'A is B'. For that matter, the categorical major 'M is P' can itself be expressed as a hypothetical 'If M, then P'; then follows in the minor an assertion of M (namely S); whence as the conclusion an assertion of P. The only *immediate* inferences that can be drawn from the purely hypothetical proposition 'If A is B, C is D' must themselves be hypothetical. These namely follow: 'If C is not D, A is not B,' 'In some case (at least once) where C is D, A is B'—the logical contrapositive and converse respectively of the original. But these are utterly unlike the conclusion 'C *is* D' got from the same hypothesis *through* the assertion 'A *is* B'.

With what reason, then, can it in any case be maintained that 'C is D' is *immediately* got from 'If A is B, C is D'? With very good reason, when *if*, instead of meaning *suppose that*, is used for *since*, *seeing that*, or *because*. It is plain that the original proposition may be thus understood: 'Since A is B, C is D'. Or take a material case. 'If it rains, the street is wet,' interpreted strictly as a bare supposition, can never of itself lead to the categorical assertion 'The street *is* wet' (as a matter of fact): it only involves immediately such other suppositions as these—'If the street is not wet, it does not rain,' 'If the street is wet, it may be from rain'. But the same expression is also used on a very different occasion: 'It rains (do you say?), why then of course the street is wet,' 'To be sure the street is wet, for does it not rain?' 'No doubt, as it rains, the street is wet'. Here we know *immediately* that 'the street is wet' (or C is D), for this is the assertion in the proposition; and the *If*-clause is not proposed as a possible ground for a conclusion, but is stated shortly as the actual reason of a fact. When expanded, it corresponds not to the first premiss of the Hypothetical Syllogism, but to the *two* premisses together. That is to say, if the clause is regarded as containing a supposition at all, it contains, besides the formal supposition 'If A is B, C is D,' the positive assurance 'A is B'. Of course from the two premisses thus *taken together*, the conclusion 'C is D' follows at once or immediately; but the same is true of the conclusion of a Categorical Syllogism as following from its *two* premisses. Now, when *if* thus covers an assertion of fact within a supposition, it may be called, as by Richardson, an *if* of inference, as containing the whole reasoned ground of the last clause in the sentence. But such a sentence is no longer the 'hypothetical proposition' of logic—that kind of thought-utterance which, though it has a different form, is as simple as the simplest categorical proposition, seeing (as before suggested) there is no categorical proposition which may not be expressed as a hypothetical, and *vice versâ*.

The true and simple sense of *If* in the antecedent part of a purely hypothetical proposition may be otherwise brought out by considering its analogy with the subject in a categorical. Take a proposition in Euclid. It is exactly the same whether we say, 'The angles at the base of an isosceles triangle are equal,' or 'If a triangle is isosceles, the angles at its base are equal'; and Euclid, like everybody else, falls as readily into the one expression as the other. Now to suppose that the consequent in this pure hypothetical is immediately given with the antecedent or follows from it directly, can amount only to saying that the predicate (in the categorical expression) is directly implied in the subject; or, in other words, that the proposition is analytic. But it is, as we know, in this case synthetic, and to bring about the synthesis an express proof is necessary. Just so we must not think of getting the consequent of a pure hypothetical from the antecedent except in the case where there is direct implication, as 'If triangle, then trilateral'.

It is worth while adding in this connexion that the other form of proposition ranged by logicians with the Hypothetical, namely the Disjunctive, may be shown to be as simple as the pure Hypothetical, being in fact a special case of it. The common view is that it involves at least two hypothetical propositions, or, as some say, even four. Thus 'Either A is B or C is D' is resolved by some into the four hypotheticals—

If A is B, C is not D (1)
If A is not B, C is D (2)
If C is D, A is not B (3)
If C is not D, A is B (4)

—but the first and third of these are rejected by others, and with reason, because they are in fact implied only when the alternatives are logical opposites. The remaining propositions (2) and (4) are, however, the logical contrapositives of one another; and this amounts to saying that either of them *by itself* is a full and adequate expression of the original disjunctive.

ENGLISH THOUGHT IN THE EIGHTEENTH CENTURY.[1]

BESIDES the remarkable work whose name is placed at the head of this article,[2] two other important contributions have recently been made to the history of philosophical thinking in England. Prof. Kuno Fischer has taken his old monograph on Francis Bacon (known to English readers since 1857 in Mr. Oxenford's translation), and so recast and enlarged it as to give not only a more adequate representation of Bacon as a man and thinker, but an account of the development of the 'Philosophy of Experience' as far as Hume, no longer quite too meagre to stand as a side-piece to that history of Modern Philosophy which he has traced on a great scale from Descartes through Spinoza and Leibniz to Kant and his successors.[3] The book in its new form appeared in 1875, and in the same year, by a curious coincidence, the late M. de Rémusat, who had before followed close on Fischer with an independent monograph on Bacon, came forward with a *History of Philosophy in England from Bacon to Locke*.[4] There is evidence of genuine research in this work, especially among the less-known writers of the seventeenth century, which should have drawn attention to it in England before this time. On the present occasion it is simply mentioned, because of the period which it seeks to compass. Where M. de Rémusat leaves off, there Mr. Leslie Stephen in his brilliant volumes may be said to take up the instruction as given in the metropolitan Colleges may easily be understood. No candidate preparing for the B.A. degree from University College had the least occasion to attend the professor's lectures on Philosophy of Mind and Logic, and accordingly the professor, having no hold upon the only auditors on whom he might regularly count, lectured during all those years to very thinly covered benches. King's College, which had started without any chair of Philosophy and obviously set much less store by the subject, was not moved now to acquire an interest in it, and went on without any means of philosophical instruction.

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[1] *Mind*, ii. 352.

[2] *History of English Thought in the Eighteenth Century*, by LESLIE STEPHEN. 2 vols. London: Smith, Elder, & Co. 1876.

[3] *Francis Bacon und seine Nachfolger*. Entwicklungsgeschichte der Erfahrungsphilosophie. Von KUNO FISCHER. 2te völlig umgearbeitete Auflage. Leipzig: Brockhaus, 1875. The greater work, *Geschichte der neuern Philosophie*, has thus far been brought down to Schelling.

[4] *Histoire de la Philosophie en Angleterre depuis Bacon jusqu' à Locke*, par CHARLES DE RÉMUSAT. 2 tomes. Paris: Didier et Cie., 1875.

No change of any importance was made in the system of philosophical examinations as at first constituted, till under the new charter (9th April, 1858) the decisive alteration in the status of the University was consummated, whereby it was cut loose from all connexion (except in the medical department) with particular places of instruction, metropolitan or other. While the question of the new constitution was still pending, in 1857, the examiners in Logic and Moral Philosophy, Messrs. Bain and Spencer Baynes, then newly appointed in place of the two who had acted together for so many years, addressed a formal representation to the Senate on the state of the examinations and submitted a very different scheme, which, with some amendments, was finally adopted at the end of 1858 and has since remained in force without further change, except as it was made to apply to the degrees in Science instituted in 1859. By this time Mr. Grote, having brought his History to a close, had become one of the most active members of the Senate (which he joined in 1850), and his interest in Philosophy, always great yet growing ever stronger with his years, led him to take special charge of the proposed scheme so long as it remained under discussion. As the University was about to admit all comers to its examinations, it was important, while substituting a scheme of reasonable extent in place of the old one, so to frame it as to encourage a resort to systematic instruction; and to this end it seemed the most effective course to prescribe no particular books but simply to indicate, as the new examiners proposed, a range of topics representing the main divisions of progressive philosophical inquiry.

The scheme propounded, and at first designed to bear the new title of "Logic and *Mental* Philosophy," was however vehemently opposed by some of the affiliated Roman Catholic Colleges on the ground that Mental Philosophy (embracing, as was stated, the Senses, the Intellect and the Will) was a department of knowledge little less vexed by polemics than theology itself, so that the examiners for the time being would be made judges of philosophical orthodoxy; and also on the ground that, even if no such evil result ensued as the propagation of a system and the creation of a London University school of Philosophy, yet Catholic students would be placed at a disadvantage, being precluded from the study of modern psychological theories till an advanced period of their course, after they were indoctrinated in the body of philosophical truth ancillary to the Theology of the Church (*Minutes of the Senate*, 1858, p. 87). It was implied, if not expressly asserted, that the previous scheme, prescribing some parts of Whately, &c., was unobjectionable—probably because of its triviality. The *Minutes* (Dec. 15, 1858) contain a very remarkable statement penned by Mr. Grote in reply to the objections; and what he urged against the notion of the least design to impose with the weight of University authority a particular view of philosophical orthodoxy, has certainly been borne out by the selection of examiners (no one of whom can serve more than five years running) from that time to the present. Professor Spencer Baynes, one of the present two examiners, has been as much in favour with the Senate as Professor Bain, and the others, in order of appointment, have been the late Professor Ferrier, Mr. Poste, the present writer, the Rector of Lincoln, Mr. Venn and now Professor Jevons.

The principle of the scheme of examinations in Logic and Moral Philosophy (the old title being in the end retained), as it came into full working order from the year 1860, is a very intelligible one. A minimum requirement for the degree of Bachelor of Arts, or of Science, is variously extended and intensified for the grade of Bachelor with Honour, and for the higher degrees of M.A. and D.Sc., while it is (in practice) somewhat attenuated for the professional degree of Doctor of Medicine or Master of Surgery. The University of

London exacts a certain amount of philosophical knowledge from every Bachelor of Arts as part of a general liberal education, and from every Bachelor of Science as part of his general scientific equipment. "Names, Notions and Propositions, Syllogism, Induction and subsidiary operations" mark with sufficient plainness the scope of the examination in Logic; and the heads "Senses, Intellect and Will, including the Theory of Moral Obligation" show that Moral Philosophy is understood in the wider sense of Mental Philosophy, while this last is interpreted chiefly as Psychology. Bachelors, whether of Arts or Science, may thereupon subject themselves to a more protracted (two days instead of one) and severer trial in the same subjects, supplemented by the topic of "Emotions," and with the "Theory of Ethics" brought into greater prominence: a scholarship of £50 for three years may here be gained. The Bachelor of Arts who now proceeds (after not less than eight months) to the special degree of Master will, if he chooses Branch III., be subjected (for three days) to examination in the old topics (only Ethical *Systems* instead of *Theory*) supplemented by a special prescription, varied every year, in Political Philosophy and History of Philosophy,[1] besides Political Economy (one day): here may be won a gold medal worth £20. The still more special degree of Doctor of Science, open only to Bachelors of Science of not less than two years' standing, may be taken in "Mental Science," with the main topics as for M.A. set out as principal subject, and the following as subsidiary subjects—"Physiology of the Nervous System and Organs of the Senses in man and other animals, History of Philosophy, Political Philosophy, and Political Economy" (in all four days): "a thorough practical knowledge of the principal subject and a general acquaintance with the subsidiary subjects" is here required. Finally the degree of M.D. or M.S. cannot be obtained without a philosophical examination (three hours), of which the nominal scope coincides with that for the B.A. or B.Sc. degrees, though there is a tacit understanding that those aspects of the subjects should chiefly be considered that are least remote from the field of medical practice.

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[1] For 1876 the subjects were: Political Philosophy—Ideal Polities or States, their nature and use, with special reference to Plato's *Republic*, More's *Utopia*, and Bacon's *New Atlantis*; History of Philosophy—The development of Locke's principles, Berkeley's *Principles of Human Knowledge* and Hume's *Treatise of Human Nature*.

The scheme, it will hardly be denied, is not only clearly conceived but betokens a real concern for the promotion of philosophical study and work. That philosophy should form part of every liberal education (B.A.), and that it may then well engage the special attention of more advanced students (M.A.) before taking up with a particular profession; that Psychology and Logic have their place in a general scientific discipline (B.Sc.), and that mental research in one or other of its departments may claim the life-long devotion of trained scientific powers (D.Sc.); lastly, that every medical man who aspires to the higher dignities of his profession (M.D., M.S.) should have bestowed some express thought on the laws of evidence and on the hidden mental life inwoven with the bodily frame—such is the meaning of the scheme; and where is there another university that makes so systematic a stand for the cause of philosophy in education? It should not be forgotten that even in the early years of the University the importance of the subject had been, in name at least, recognised, in deference, it may be supposed, to the principles of the original movers for university-education in London; and thus it was easier for an earnest friend of philosophical study like Mr. Grote, himself one of them, to get the reformed scheme in its completeness set on foot when the new constitution imposed upon the Senate the duty of making the examinations at once broad and effective. On looking, however, beyond the scheme itself to its actual working, there seems less ground for satisfaction, and the reason will perhaps be found to lie in that very peculiarity of constitution with reference to which the scheme was so carefully devised. The Senate would no longer require of candidates for degrees that they should have been instructed in particular colleges; but it hardly expected that a great proportion of them would cease to frequent any place of instruction. It started with an earnest determination to maintain a high standard of requirement: it did not foresee that away from a base of instruction the standard could be neither constant nor high.

It was certainly from no desire to discourage systematic instruction that the more enlightened members of the Senate stood by the plan of opening the University examinations to all comers in the teeth of strong remonstrance from all the more important affiliated colleges. With affiliation carried out as it had been in the first twenty years, the truth was that no shadow of reason remained for excluding almost any decent secondary school from the list of the institutions whence the University received certificates for degrees in arts and laws; and the only sensible step forward, when there was no question of taking a great many steps backward to the original position of founding in reality as in name a University of London, was of course to admit candidates without reference to their place of instruction. This had become clear, not only to the majority of the Senate, who from one motive or another had gone on relaxing the conditions of affiliation, but also to those members (like Mr. Grote) who had struggled in vain for the maintenance of stricter principles; and the step once fairly contemplated, there was no stopping short of the final position that the University should confine itself to its own work of examining, whether or not candidates had been regularly instructed at all. It all followed as naturally as possible from the University being set up, not as a means of organising the higher instruction in the capital, but to perform directly a certain useful kind of work for the country at large. At the same time the notion of fair and open examination for all with perfect free-trade in teaching had an air of liberalism about it that imposed on many minds, as it still is the idol of Mr. Lowe; and it was only to be expected that some ardent advocate should urge what lustre would be shed on the University that welcomed to its examinations "the heroic stonemason," beholden to no college whatever for instruction. Nevertheless, as I have said, the intention of the best heads was rather to encourage than depress instruction, and as regards the initial (B.A. and B.Sc.) examination in Philosophy it was even expressly intimated that the amount of acquirement expected was such as might fairly be attained by a course of instruction in a class during the year preceding examination. It is interesting then to see what kind of philosophical study the scheme of the University has in practice evoked during the last fifteen years.

The broad result is that a full half of the yearly tale of Bachelors of Arts (to take the most representative class of graduates) acquire their knowledge of philosophy by private reading without instruction, while the proportion of such private students to the whole number of candidates for examination is considerably greater. Of the others who pass as Bachelors, some ten or twelve may have had more or less of formal instruction in Catholic or Dissenting theological colleges, and the rest are students of the only two general academic institutions that remain in any sort of regular connexion with the University, namely, University College, which sends up yearly about a dozen men, and Owens College, Manchester, whose usual quota is less than half as many. (King's College, which still does not include Philosophy in its scheme of instruction, has practically ceased to maintain any relations with the University of which it was to be a chief feeder.) Now the number of students who go up from University College shows no tendency to increase, and the authorities of Owens College have just made it part of their plea for being turned into an independent university that fewer and fewer of their instructed students care to look to the London examinations. Some serious questions thereupon arise. What is the effect on the philosophical examinations of the unexpected predominance of private-study candidates? And what is the real value of the carefully elaborated scheme for candidates of that class? I am afraid it must be answered that, in such circumstances, an examination tends to become whatever test a fair proportion of candidates for the time being are found able to pass. Nobody is to blame, and yet it is so. The authorities may be sincerely anxious to maintain a good standard, the examiners may set the most carefully considered papers; all the same, when the list of the rejected comes to be determined, it is not in human nature not to take account of the actual performance of the bulk of the candidates and accommodate the standard to the exigencies of the occasion. Then the candidates, in course of time, discover that certain books most nearly correspond with the scope of the examination, and the examiners, however careful they may be to put open questions, cannot refuse a stereotyped form of answer or bear hard on those candidates whose obviously limited reading has left them without the means of answering any but a determinate class of questions. Thus practically the examination comes to turn upon books after all; and the formal divorce of the University from any system of instruction leaves it to be supposed that the reading of one or two philosophical books constitutes an effective mental discipline. But nothing could be more fallacious. I doubt if any one who has read the written answers of the multifarious crowd of candidates for the B.A. degree, the majority of whom have come into contact with no living instructor, can hold it an unmixed good that an examination in Philosophy is imposed upon all under the present constitution of the University. The subject, so nearly concerning every reflective human mind, and most fitly therefore regarded as crowning a liberal education, is yet the one of all others that may least be left to undirected private reading in the case of the mass of students. Certainly there are a few minds here and there, now and again, who with or without formal instruction follow a native bent and can be trusted to work their way to clearness and coherence of thought on the questions of human origin and destiny, but with the multitude of learners it is quite otherwise. A little book knowledge of philosophical questions, when not a dangerous, is truly a most unprofitable thing. That general students may profit by a course of philosophical instruction there is the experience of the Scottish Universities to show; and the number of distinguished thinkers who have risen in the ranks of Scottish professors represents a real national gain yielded by an organised system of public instruction in Philosophy. It is to be charged against the London University that all its elaborate machinery does nothing to help on the work of instruction, but rather has the contrary effect as regards the higher elements of human culture. At least as respects Philosophy, while it is certain that Grote and others looked forward to a great development of instruction, the advance made in the last fifteen years has been quite insignificant.

University College has its professor of Philosophy of Mind and Logic who lectures year after year to a small voluntary class of young students attending the College, with a few additional hearers from without, but has no constituency to draw upon for higher work in the subjects, because candidates for the special degree of M.A. at the University are a handful altogether in any year, and, besides, are scattered through the country, or, if in London, are generally engaged already in some active pursuit interfering with continuous study. Owens College in Manchester has a professor who as yet at least is in no more favourable position as regards auditors, while he is weighted with the additional subject of political economy. Besides these two there is no other public professor of Philosophy in all England outside of Oxford and Cambridge. Such instruction as is given in some Dissenting theological colleges or in Catholic colleges is of course discounted, though it should not be forgotten that one theological seminary in London has long been signalised by the teaching of Mr. Martineau. The statement whether as regards the country or as regards London will sound incredible to foreign ears, and may astonish even English readers when presented in its nakedness. Meanwhile the old Universities, as the readers of this journal have been told on the best authority, do not come near to discharging the national work that is otherwise left undone; however great be the credit due to the band of earnest instructors who are labouring to establish a due balance of education at Cambridge by the revival of Philosophy, or whatever be the evidence of serious thinking at Oxford at a level high above the arena of the examination-schools. One can only hope for a day to come when in London some organised system of highest instruction will supersede the wasteful efforts of rival institutions now ill-equipped or incomplete, and trust that in that day the importance of Philosophy as a mediating influence between letters and science will be fully recognised. How the reform may be brought to pass, there is little as yet to show. Perhaps the University of London, having done a good work in stirring up the country to a sense of the need of broad secondary education, will after all be transformed, for the good of the country's capital, into the likeness of that original seat of high learning which was projected to bear the name; taking up into one coherent academic system the two Colleges that sprang out of the first movement and the special scientific schools that, by a lavish appropriation of public money, have in later years been founded without the least regard to the private sacrifices made half a century ago. Perhaps University College itself, as the original depositary of the academic trust for London, will, after its long struggle with faint success to make the higher education self-supporting, receive from public or private sources the endowment that all human experience has proved to be indispensable for its maintenance, and will expand into a great school of all science and learning that need not look outside to the cramping standard of even the best examining body that is nothing else. In one way or another the reproach that adheres to superior instruction in London and to philosophical instruction with the rest cannot too soon be taken away.[1]

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[1] Within the last few months a Society has actually been formed with the professed object of organising University Education in London, and as, in the view of the foregoing article, the question of philosophical instruction is bound up with the larger problem, a word or two upon the latest attempt to solve it may not be out of place. The Society has arisen out of a movement by one or two meritorious institutions that give instruction in the evening to persons engaged in business by day. These were desirous to obtain the services of young Cambridge lecturers like those who in late years have been breaking ground in northern towns; but oddly enough, the humble design was given out as the beginning of a scheme for University Education in the metropolis, as if such a thing had never before been thought of, and London were another Nottingham upon which a reflexion of academic light might be induced to fall. Soon, however, the movers and their influential friends, some of whom were less ignorant than forgetful of what had been done in former days, awoke to a sense of the difference between London and a provincial town, and the scheme then took a new shape. The notion was now to invoke the two older Universities with the University of London to take the metropolitan field in charge with the view of supplementing the instruction already given within it, and a very elaborate working-plan was devised. But as Oxford and Cambridge have since declined the proffered charge, the Society is left to make what way it can within London itself.

One desires to speak with all respect of any serious effort directed towards the end proposed, and there has undoubtedly been no small energy displayed in the establishment of this Society. The observation cannot however be forborne that its founders have from the first kept before them no distinct conception of what is meant by University Education. If their main object, as there is still some reason to suppose, is to provide additional evening instruction in different parts of London, the name of University Education is surely misapplied. If, on the other hand, it be true academic work which they are eager to foster, the simplest way, one would think, is to develop the two Colleges that have struggled to maintain the higher learning for nearly fifty years past. But it would seem as if in London there were never to be an end of new beginnings.

Supplementary Note.—For an important change (of principle) in the B.Sc. regulations, just announced, see *News* at the end of this number.

Since the article on *Philosophy in London* in the present number was written, an important change has been announced in the plan of examinations for the degree of Bachelor of Science in the University, whereby Logic and Psychology will cease to be compulsory subjects; and thus vanishes one of the most characteristic features of the general scheme of the University as set forth in the article. The B.Sc. examination will as before consist of two stages, but will not henceforth have reference to a merely *general* discipline in the sciences. At the second stage, instead of being required as heretofore to pass in five different subjects making with the four subjects of the first stage a tolerably complete round of the chief sciences, a candidate in future need not bring up more than three out of nine subjects, of which Logic and Psychology form one. That is to say, he will begin to *specialise* before reaching the grade of Bachelor. Care, however, is taken to make the earlier examination more comprehensive than hitherto—in fact, fairly co-extensive with the field of general science as commonly understood. The practical and other reasons for the change are very strong, nor is it greatly to be regretted, in the present state of instruction or feeling about instruction as described in the article, that the philosophical examination will no longer be imposed on all the candidates. At the same time it is right to point out that the general scheme of the University is dislocated by giving the B.Sc. degree (even partially) a special character; while if Logic and Psychology are allowed (as they are) to rank as Science, they cannot properly be ranged (as they are) with departments so special—not to say concrete—as botany, zoology, or physical geography and geology. About Psychology there may be a question, if it is not clearly conceived as the great fundamental subjective science—the root of one half of human knowledge, or rather, the key to one whole side of all human knowledge; but surely Logic at least pertains to the most general scientific discipline. In no longer requiring a knowledge of Logic from its Bachelors of Science, the University is throwing away one of its chief distinctions, and will not so easily replace or recover it.

No change has been made in the regulations for admission to the degree of D.Sc., except that candidates who have prolonged the interval between the first and second stages of the B.Sc. examination from one year to two years or more, over their special studies, may go up for the Doctorate after a single year instead of two years as before. This change seems a reasonable one in the new circumstances; but the reform really called for in the D.Sc. regulations is that some evidence of original work should be required from the candidates, by way of written dissertation or otherwise. In the department of Mental Science at least, the written answers to papers of miscellaneous questions which are at present the only test imposed, keep the degree practically at the level of the ordinary M.A. (Branch III.), except in so far as the greater range of subjects implies a longer and wider study. But this very width of range—extending from

Physiology of the Nervous System through Mental Philosophy (in all its branches) to Political Philosophy—is itself a grievance. When a man has begun to specialise to any purpose, he will find in any one of the subjects indicated occupation enough—supposing that "a thorough practical knowledge" is by all available means exacted. It is doubtless because of the extreme width of the range of the examination that in all the last sixteen years since the degree was instituted, no more than two candidates have presented themselves for the Doctorate in Mental Science. One of them, Mr. P. K. Ráy, a native of Bengal, has this year succeeded in passing, but such a result is hardly a sufficient justification of the present examination-scheme.

THE LOGIC OF "IF".[1]

I HAVE lately come across a passage in *Clarissa Harlowe* where Richardson indicates with great clearness a distinction which has long seemed to me to be overlooked by logicians in their treatment of Hypothetical Syllogism. It is in the admirable scene where Morden and Lovelace are first brought together, and runs thus: Morden: "But *if* you have the value for my cousin that you say you have, you must needs think——" Lovelace: "You must allow me, sir, to interrupt you. *If* I have the value I *say* I have. I hope, sir, when I *say* I have that value, there is no cause for that *if*, as you pronounced it with an emphasis." Morden: "Had you heard me out, Mr. Lovelace, you would have found that my *if* was rather an *if* of inference than of doubt."

The question has been much debated among logicians whether the so-called Hypothetical Syllogism of this type

If A is B, C is D
But A is B
∴ C is D

is a *mediate* inference like the common Categorical Syllogism, or whether the conclusion is not *immediately* drawn from the one premiss 'If A is B, C is D'. Prof. Bain, for example (*Logic*, i. 116), would deny that the reasoning is mediate, and the reader may consult his work for a short summary of the different arguments urged by Mansel and other distinguished logicians on the same side of the question. Some of the arguments, indeed, are too plainly defective, as when Mansel declares that in the Hypothetical Syllogism "the minor (A is B) and the conclusion (C is D) indifferently change places and each of them is merely one of the two members constituting the major"—which is not the case in Categorical Syllogism. Here he commits a very great blunder, since it is notorious that 'A is B' cannot be got as a conclusion with 'C is D' as second premiss. However, the whole weight of authority in favour of the inference being *immediate* is undoubtedly great, and if one takes the other view, some explanation must be found for the strong array of opinion that may be cited against it.

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[1] *Mind*, ii. 264.

It seems obvious enough that when the proposition 'If A is B, C is D' is uttered as a pure hypothesis—the *if*, as Richardson expresses it, being one of *doubt*—it is not possible to pass directly to the assertion that 'C *is* D'. This can be reached only through the other assertion 'A *is* B'; and what is the reasoning then but *mediate?* If the conclusion, which is quite a different proposition from the original datum, is here not mediately reached, there is no such thing as mediate reasoning in categoricals. Whatever meaning there is in saying that given 'M is P,' we arrive at the different proposition 'S is P' only mediately—through 'S is M,' there is as much meaning in saying the like of 'C is D' obtained as a positive assertion from the supposition 'If A is B, C is D' only *through* the positive assertion 'A is B'. For that matter, the categorical major 'M is P' can itself be expressed as a hypothetical 'If M, then P'; then follows in the minor an assertion of M (namely S); whence as the conclusion an assertion of P. The only *immediate* inferences that can be drawn from the purely hypothetical proposition 'If A is B, C is D' must themselves be hypothetical. These namely follow: 'If C is not D, A is not B,' 'In some case (at least once) where C is D, A is B'—the logical contrapositive and converse respectively of the original. But these are utterly unlike the conclusion 'C *is* D' got from the same hypothesis *through* the assertion 'A *is* B'.

With what reason, then, can it in any case be maintained that 'C is D' is *immediately* got from 'If A is B, C is D'? With very good reason, when *if*, instead of meaning *suppose that*, is used for *since*, *seeing that*, or *because*. It is plain that the original proposition may be thus understood: 'Since A is B, C is D'. Or take a material case. 'If it rains, the street is wet,' interpreted strictly as a bare supposition, can never of itself lead to the categorical assertion 'The street *is* wet' (as a matter of fact): it only involves immediately such other suppositions as these—'If the street is not wet, it does not rain,' 'If the street is wet, it may be from rain'. But the same expression is also used on a very different occasion: 'It rains (do you say?), why then of course the street is wet,' 'To be sure the street is wet, for does it not rain?' 'No doubt, as it rains, the street is wet'. Here we know *immediately* that 'the street is wet' (or C is D), for this is the assertion in the proposition; and the *If*-clause is not proposed as a possible ground for a conclusion, but is stated shortly as the actual reason of a fact. When expanded, it corresponds not to the first premiss of the Hypothetical Syllogism, but to the *two* premisses together. That is to say, if the clause is regarded as containing a supposition at all, it contains, besides the formal supposition 'If A is B, C is D,' the positive assurance 'A is B'. Of course from the two premisses thus *taken together*, the conclusion 'C is D' follows at once or immediately; but the same is true of the conclusion of a Categorical Syllogism as following from its *two* premisses. Now, when *if* thus covers an assertion of fact within a supposition, it may be called, as by Richardson, an *if* of inference, as containing the whole reasoned ground of the last clause in the sentence. But such a sentence is no longer the 'hypothetical proposition' of logic—that kind of thought-utterance which, though it has a different form, is as simple as the simplest categorical proposition, seeing (as before suggested) there is no categorical proposition which may not be expressed as a hypothetical, and *vice versâ*.

The true and simple sense of *If* in the antecedent part of a purely hypothetical proposition may be otherwise brought out by considering its analogy with the subject in a categorical. Take a proposition in Euclid. It is exactly the same whether we say, 'The angles at the base of an isosceles triangle are equal,' or 'If a triangle is isosceles, the angles at its base are equal'; and Euclid, like everybody else, falls as readily into the one expression as the other. Now to suppose that the consequent in this pure hypothetical is immediately given with the antecedent or follows from it directly, can amount only to saying that the predicate (in the categorical expression) is directly implied in the subject; or, in other words, that the proposition is analytic. But it is, as we know, in this case synthetic, and to bring about the synthesis an express proof is necessary. Just so we must not think of getting the consequent of a pure hypothetical from the antecedent except in the case where there is direct implication, as 'If triangle, then trilateral'.

It is worth while adding in this connexion that the other form of proposition ranged by logicians with the Hypothetical, namely the Disjunctive, may be shown to be as simple as the pure Hypothetical, being in fact a special case of it. The common view is that it involves at least two hypothetical propositions, or, as some say, even four. Thus 'Either A is B or C is D' is resolved by some into the four hypotheticals—

If A is B, C is not D (1)
If A is not B, C is D (2)
If C is D, A is not B (3)
If C is not D, A is B (4)

—but the first and third of these are rejected by others, and with reason, because they are in fact implied only when the alternatives are logical opposites. The remaining propositions (2) and (4) are, however, the logical contrapositives of one another; and this amounts to saying that either of them *by itself* is a full and adequate expression of the original disjunctive.

ENGLISH THOUGHT IN THE EIGHTEENTH CENTURY.[1]

BESIDES the remarkable work whose name is placed at the head of this article,[2] two other important contributions have recently been made to the history of philosophical thinking in England. Prof. Kuno Fischer has taken his old monograph on Francis Bacon (known to English readers since 1857 in Mr. Oxenford's translation), and so recast and enlarged it as to give not only a more adequate representation of Bacon as a man and thinker, but an account of the development of the 'Philosophy of Experience' as far as Hume, no longer quite too meagre to stand as a side-piece to that history of Modern Philosophy which he has traced on a great scale from Descartes through Spinoza and Leibniz to Kant and his successors.[3] The book in its new form appeared in 1875, and in the same year, by a curious coincidence, the late M. de Rémusat, who had before followed close on Fischer with an independent monograph on Bacon, came forward with a *History of Philosophy in England from Bacon to Locke*.[4] There is evidence of genuine research in this work, especially among the less-known writers of the seventeenth century, which should have drawn attention to it in England before this time. On the present occasion it is simply mentioned, because of the period which it seeks to compass. Where M. de Rémusat leaves off, there Mr. Leslie Stephen in his brilliant volumes may be said to take up the tale; and, though there could not well be a greater difference in the spirit and scope of the two works, there is much in the later history that may be better understood for the careful record of the earlier time which we owe to a foreign hand.

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[1] *Mind*, ii. 352.

[2] *History of English Thought in the Eighteenth Century*, by LESLIE STEPHEN. 2 vols. London: Smith, Elder, & Co. 1876.

[3] *Francis Bacon und seine Nachfolger*. Entwicklungsgeschichte der Erfahrungsphilosophie. Von KUNO FISCHER. 2te völlig umgearbeitete Auflage. Leipzig: Brockhaus, 1875. The greater work, *Geschichte der neuern Philosophie*, has thus far been brought down to Schelling.

[4] *Histoire de la Philosophie en Angleterre depuis Bacon jusqu' à Locke*, par CHARLES DE RÉMUSAT. 2 tomes. Paris: Didier et Cie., 1875.

Much as he has to say about philosophers and their work, great and small, Mr. Stephen has not written or professed to write a History of Philosophy in the stricter sense. His aim and even his method of constructing the book are disclosed with the utmost candour. It was his first object to trace systematically and in full detail the course of Religious Thought from 1688 to 1750, the period defined and rapidly sketched in Mr. Pattison's well-known essay. Lechler, more than thirty years ago, gave an adequate account of the Deists proper, but did not concern himself, save incidentally, with their orthodox opponents, though these (as Mr. Pattison sought particularly to impress) betrayed the same general tendencies of thought. It accordingly seemed necessary to Mr. Stephen to trace back the common theological tendencies of the age to the philosophical ideas then prevalent; and upon this there was an interest in showing how the principles accepted in philosophy and theology were applied to practice in the sphere of moral and political thought, or, again, reflected in the imaginative literature of the time. As thus explained, the scope of the book is of course very different from that of a technical History of Philosophy, and it is in fact so comprehensive that almost everything appears to be included in the author's survey of thought or intellectual activity in the century, except the work of special science.

Is he justified in giving to the word Thought at once such an extension and such a restriction, as to include in the same treatise with thinkers like Locke and Hume and Butler, poets and novelists and preachers like Burns and Fielding and Wesley, to the exclusion of scientific inquirers like Newton or Black or Hunter? Mr. Stephen, though himself doubting whether his title is not too ambitious, evidently is guided by some definite principle in determining the scope and limits of his work; and perhaps it may be gathered, in default of more express statement, from the beginning of his last chapter, where he passes, after dealing successively with philosophers, theologians, moralists and publicists, to the delineation of what he calls the 'Characteristics' of the age. The literature of a people, we are told, may be disposed under three heads: (1) historical, which records facts and summarises or amplifies existing knowledge; (2) speculative, which discusses the truth of the theories binding knowledge together; and (3) imaginative, which utters the emotions generated by the conditions in which men are or believe themselves to be placed. Here, Science is either excluded from Literature altogether as a technical pursuit, or it is included in the wider sense of History, which regards nature in all its varied aspects as well as man. In either case, since History itself is not brought within Mr. Stephen's scheme, Science as the sum of existing positive knowledge about the world is naturally excluded. But besides the properly philosophic thought which seeks rationally to co-ordinate the variety of human knowledge with a view more or less direct to practical conduct, it is natural to consider the imaginative synthesis, since by this (as he urges) is determined the action of the majority of mankind, and further (as he might have added) because the philosophical synthesis, not being in the same way verifiable as the generalisations of positive science, must always contain an element of subjective sentiment allying it to imaginative literature. If some such view was present to Mr. Stephen's mind, there is not wanting a good reason for the limitation of subjects in his book; while, on the other hand, his readers may be glad that he has so far widened his scheme as to give them, in his well and often brilliantly written pages, a varied picture of national thought and feeling alive with human interest, instead of the abstract and one-featured record, apt to be misleading, which History of Philosophy commonly is. Nor in this case at least is good literary effect procured at the expense of careful research. The one objection, perhaps, in point of form, that can be brought against the book as a History of Thought, is the unequal prominence given to the phases of religious as compared with philosophical opinion,—if it is not too ungracious to say so, when Mr. Stephen has implied in his ingenuous preface that, but for his interest in the religious movements, we might not have had from him a view of the century at all.

In Mr. Stephen's view one figure stands forward at the beginning, and re-appears towering above all others in every scene of the history. Whether it be the philosophy, or the theology, or the morals, or the politics of the century that is under review, the decisive word, representing the last outcome of what was in men's minds, is always uttered by Hume. Half-way through the century dogmatic speculation about the supernatural ceased of a sudden: Hume had spoken, and ever afterwards those who were concerned to save the conclusions of metaphysical philosophy had no choice but to try for them by another road. About the same time the hot theological warfare that had filled the world with clamour for two generations died away: Hume had sprung a mine that sent into the air both deists who were not Christians, and Christian apologists who were but deists. It took fifty years from the time of Locke before the utilitarian ethics, so congenial to the national mind, got a definite philosophical expression—from Hume. Hume left nothing unsaid which the acutest intellect could say about political philosophy so long as men were supposed independent atoms, and there was no thought of organic evolution or serious consideration of historical development. And if the historical spirit began to awake in the second half of the century in preparation for the work of the age to come, even in this forward movement Hume too had part. When we remember, besides, who it was that almost disowned the rugged work of his strong youth, and desired to be judged by the fastidiously polished but less searching essays of his prime, we see with what reason Mr. Stephen may take Hume as quite the representative thinker of a century quick with intellectual activity, only not the deepest.

Should we try, further, to gain a comprehensive view of the whole course of thought in the century, as it presents itself to Mr. Stephen, the spectacle resolves itself into a number of scenes which, described in very general terms, are these: (1) A movement of determined philosophical criticism lasting fifty years or more from Locke to Hume, destructive of the whole edifice of speculative metaphysic reared by Descartes and his followers in the seventeenth century, but neither itself constructive otherwise nor exciting (in England), while the century lasted, any philosophical construction of real and permanent importance. (2) A rationalistic movement in religion, prepared in the seventeenth century, and following naturally from the principles of Protestantism, at first promoted by the influence of the current philosophical ideas, yet in the end suppressed by the advance of philosophical opinion, or changed into a historical investigation of the external evidences for a supernatural revelation. (3) A movement to find a rational ground for moral action, by way of supplement to the weakened force of the theological sanction, or as a substitute for it when altogether rejected. (4) A corresponding movement, less earnestly maintained, to explain on rational principles the social and political relations subsisting between men, upon the decay of the notion of supernatural ordinance. (5) Within this last movement, a special determination towards economic inquiry. (6) Finally, a varied literary movement, at first reflecting very faithfully the dominant philosophical and religious conceptions, but afterwards, as these became effete without begetting others, opening out into new lines of sentiment which anticipated the rational thought and inquiry of the coming time.

It is not possible, in short compass, to do anything like justice to the working out of so comprehensive a scheme as this of Mr. Stephen's, but as the philosophical and ethical movements, which are of special interest to the readers of this journal, happen to be rather compendiously treated, we may look a little more closely at his view of these.

The dogmatic philosophy which the 'English Criticism' broke down was the metaphysical system inaugurated by Descartes, and, according to Mr. Stephen (though the point is never very clearly established and is more than doubtful), the same system, with its abstract assumptions and deductive method, dominated the minds of the chief English rationalists in religion, whether orthodox or deistical. He therefore begins with a short account of the Cartesian philosophy. He makes no reference to Bacon, and but incidental reference to Hobbes, the great English thinkers of the seventeenth century, and this may appear strange; yet there is reason for the omission. Bacon and Hobbes were, each in his generation and in his own way, true representatives of the English spirit in philosophy, but it was not till Locke abandoned any such attempt as either of theirs to construct an objective system of universal knowledge, and threw himself upon a critical investigation of the mind's powers, that England joined properly in the modern philosophical movement of Europe. It is true that Descartes himself, the great leader of the movement, had sought, from his philosophical starting-point, to work out also an explanation of the concrete phenomena of nature. Before the end of the seventeenth century, however, the attempt was practically discredited by the advance of positive physical science from the time of Galileo; and Locke showed a true appreciation of the *Zeitgeist*, when, in an age that produced "such masters as the great Huygenius and the incomparable Mr. Newton, with some other of that strain," he thought it "ambition enough to be employed as an under-labourer in clearing the ground a little, and removing some of the rubbish that lies in the way to knowledge". In words of too great modesty, we have here from Locke himself a statement of the true work of philosophy in modern times, and we see how in him English philosophical thought comes into relation with the general European movement which, however diverted by this or that speculative genius, has always been directed to the fundamental inquiry as to the ground and limits of knowledge. In particular, the Cartesian philosophy was an attempt to found certainty of knowledge upon the immediate deliverances of adult consciousness, without consideration of the sources and development of knowledge, and in respect of method sought to proceed by way of rational deduction in constructing a fabric of metaphysical doctrine. This was exactly what Locke set himself from the very foundation to oppose. That the question of the validity and limits of knowledge must depend upon an inquiry into its origin and development was his deepest philosophical conviction; and though, as Mr. Stephen well points out, he and his successors till Hume were really at one with the Cartesians in restricting the inquiry to the consciousness of the individual as known by introspection, and had not a different conception of the meaning of real existence, yet the difference of method could not but lead to very different conclusions. How far Locke himself applied the critical solvent to the system of dogmatic metaphysics, and how, with diverse aims, it was further applied by Berkeley and Hume, is clearly and vigorously set forth in general lines by Mr. Stephen. The result was what we know—that rational speculation by itself, apart from experience, was stripped of all authority.

Mr. Stephen, having always more than an antiquarian interest in his subject—being, in fact, for a historian, too much rather than too little apt to sit in judgment, as well as set forth and explain—is especially careful to consider the attitude of Hume, so as to find a way out of the deadlock to which the great doubter seemed to bring all human inquiry, while shattering the system of speculative metaphysic. He finds that Hume's point of view was essentially artificial; that he did not think of the mind of the individual in its true relation to the social organism—as moulded by influences quite different from the disjointed and haphazard sense-impressions out of which he supposed the whole fabric of intellectual consciousness had ever anew to be reared by and for each person; that he had no historical sense, much less a glimmer of that scientific notion of the evolution of all organic life which since then has so profoundly affected the work of philosophical interpretation. The criticism, though not very elaborate, is, as far as it goes, admirably conducted, and is an attempt of a kind that has been too seldom made by sympathisers with Hume's philosophical spirit to maintain it intelligently in the altered state of human knowledge since his time. As such, Mr. Stephen's judgment deserves the attention of those champions of a different philosophy who seem to think that a textual sifting of the writings of Locke and Hume, revealing manifold inconsistencies and defects of thought, is the most effective way of dealing a death-blow to the cause of Experientialism at the present day. But—in exhibiting Hume as the hero of a philosophic movement, which effectually accomplished a work of destruction, yet did it from principles which could lead to no constructive result, so that only after a long lapse of years and by means of varied research in history and special science was there gradually formed, in these latter days, something like an adequate experiential philosophy—Mr. Stephen has not given sufficient prominence to one very marked phase of English intellectual inquiry in the eighteenth century, and has thus been led to do some injustice, if not to Hume's predecessors, at least to his contemporaries and successors within the century. Psychology, if it is viewed as science, has yet an exceptional standing in relation to philosophy, and cannot be neglected in a history of philosophic thought in England, where it has been so steadily cultivated without being too carefully discriminated from philosophy proper. Now Mr. Stephen, in his exposition, nowhere gives much attention to the progress of psychology, though this was very remarkable within the century; and hence he fails to assign due importance to one in particular of Hume's contemporaries—David Hartley. His somewhat disparaging estimate of Reid, in the last generation of the century, might also have been relieved by an allowance of serious purpose as a psychological inquirer to one who himself achieved something, and moved others to achieve more.

It should be well understood that Locke's work, the beginning of all that followed in England, had two sides, which, however related to one another, may be clearly distinguished, and were in fact the occasion of two different lines of development in English thought. Essentially a philosopher in his concern for the general problem of knowledge, he sought for the solution of it in a psychological spirit, and he was the first who expressly took up this position. He differed from his predecessors, not only in his philosophical conclusion, but from all of them—even his own countryman Hobbes—in putting forward the psychological question of the growth of knowledge as the first to be answered. And however undeveloped his own psychology was, it soon appeared from what followed how effectively he had given an impulse to new inquiry. Berkeley did not only philosophise after the manner of Locke, showing, with the special theological purpose that moved him, how all knowledge was based on experience, and that no experience could be assigned portending an absolute existence of matter: he began in his *New Theory of Vision* the work of special psychological investigation after the manner of positive science. Even Hume, though his lasting importance consists in his properly philosophical activity, set out at the beginning with the distinctly psychological aim of founding a "science of man" on "experience and observation" like "the other sciences," or, as he also expressed it, of making an "application of experimental philosophy to moral subjects," as it had already been made to physical nature. Now what Hume thus professed to do, but diverging into the critico-philosophical vein left for the most part undone, this Hartley expressly essayed and carried through, however he may have also sought to combine therewith an extraneous (ethical and religious) purpose; and he did it as following out the work of Locke in the spirit of Newton. If Locke, Berkeley and Hume are a series representing the natural development of English philosophical thinking at the time, Locke, Berkeley and Hartley are another series representing a movement of psychological inquiry then begun and destined to become ever broader and deeper. And the second series is certainly not the least important when we look beyond the century to what followed. The most characteristic English work of the later time has been done in the track of Hartley rather than of Hume. This is true even of the work, not psychological, of the younger Mill, who, though he presented as a logical theory of positive science a doctrine allied to Hume's negative philosophy, did not borrow it from Hume, but rather worked it out independently as the proper philosophical complement to the psychology of Hartley and his father, Hartley's close adherent. It is still more true of the psychological work of the so-called Associationists, James Mill and his successors, whether of the straiter sect of individualists, or of the broader persuasion inspired with the doctrine of evolution. The note of English psychology thus far has been the study of mental phenomena in relation with physiological conditions (wherever these can be made manifest), and this without express metaphysical assumption, or even to the exclusion of metaphysical assumption, as in the positive sciences generally, whose advance has depended on their being thus pursued. To Hartley, more than any other, it is due that the science of mind has been brought (on the side on which it can be brought) into relation with physiology, and it is too little recognised with what extraordinary insight he anticipated some of the most important results now established in physiological psychology; while, if it cannot be equally said that he steered clear of metaphysical assumptions at the beginning, it may be affirmed that his positive doctrine of mental acquisition is developed without the least reference to them. To speak of him as Mr. Stephen does, as a materialist, because he takes account of physical conditions throughout, is no more fitting than it would be to use the same term of any scientific psychologist of the present time; or, if he is so described because he supposed the consciousness of the individual to result wholly from a grouping of incidental experiences, the term is no more applicable to him than to Locke. Curiously incoherent as are the parts of his general philosophic system (if philosophic it can be called), his psychology stands as one of the most remarkable intellectual productions of the eighteenth century, destined later, if not at the time, to have the deepest influence upon 'English Thought'.

Passing now to the Moralists, we find Mr. Stephen's exposition guided by one main conception. So long, he maintains, as theology was a vital belief in the world and preserved a sufficient infusion of the anthropomorphic element, it afforded a complete and satisfactory answer to the common questions of ethics—what is meant by 'ought' and 'goodness' and what are the motives that induce us to be good. Nor did the inquiry into the nature of our moral sentiments naturally suggest itself; the only moral inquiry likely to flourish was casuistry, or the discussion as to the details of that legal code whose origin and sanctions were abundantly clear. But wider speculations as to morality inevitably occurred as soon as the vision of God became faint. It was growing faint in the seventeenth century when Hobbes could venture to put the bold questions he did. It had become so faint in the eighteenth century that men stood in face of a strictly practical issue: How was morality to survive theology? Hence the outburst of ethical inquiry by such a multitude of thinkers. Mr. Stephen ranges them under three main heads: (1) the Intellectual School of Clarke, Wollaston and Price; (2) the Common Sense School of Butler, Hutcheson and Reid; (3) the Utilitarian School, founded on Locke and comprehending such different representatives as Hume, Waterland, Tucker and Paley. Shaftesbury and Mandeville are at the same time treated incidentally at considerable length, as representing extreme phases of the recoil from the abstract metaphysics of the intellectualists; and a separate section is further given to Hartley and Adam Smith, because of their different attempts to trace the psychological genesis or derivation of the moral faculty in man.

In these ethical sections, Mr. Stephen never loses his hold upon the reader's attention, and not seldom he appears, perhaps, at his best both as a writer and as a philosophical critic. Especially when he has to deal with Hume, the exposition becomes masterly, and there is a very striking argument against looking for the root of morality in such an individualistic psychology as that beyond which all Hume's acuteness never carried him. Mr. Stephen's way of putting the alternative position is to say that the ethical problem cannot be solved except on the basis of a scientific sociology, but, whether called sociology or a truer psychology that refuses to look at the mental development of the individual apart from the social medium into which he is born, the basis is that which must be chosen by any clear-sighted experientialist at the present day. After Hume, the thinker who here as a moralist, or elsewhere as a philosophic theologian, receives most worthy appreciation from Mr. Stephen, is Butler. The serious, not to say sombre, mood of the man, oppressed with a sense of the dire reality of existence in an optimistic age, strikes a sympathetic chord in the mind of his critic, and evokes a response whose strength is hardly weakened by their speculative difference of opinion as to the supernatural. Of Mr. Stephen's other estimates, that of Samuel Clarke is among the most successful. Like Butler, Clarke falls to be treated at two places in his different characters of theologian and moralist, and both must be consulted for the judgment of him in either capacity. Mr. Stephen compares him, by a very happy inspiration, to another famous Cambridge doctor, better known in these days but not more prominent as an intellectual figure than Clarke was in his time—namely, Whewell. Clarke's distinction, while bred under English conditions and holding in great part by native authorities in science and philosophy, was that he had drunk also at foreign springs, and knew at once how far it became an

English theologian to go with outlandish speculative philosophers and when it was necessary to stop or even to lift up his voice against their wayward aberrations. Mr. Stephen rather overstates his dependence on Descartes, or overlooks his dependence on Newton and his relation to Locke. There is also some want of precision in the passage referred to (vol. i. p. 119), where Leibniz is specially named as the thinker to whom Clarke stood "in the same sort of relation which Whewell occupied to modern German philosophers" (meaning Kant). But, all the same, the comparison remains a very felicitous one, and the remark which follows, that "in softening the foreign doctrines to suit English tastes he succeeds in enervating them without making them substantially more reasonable," while throwing a real light upon Clarke, is a good instance of Mr. Stephen's power, displayed throughout his volumes, of dropping observations that strike home in regard to thinkers not so far removed as those of the eighteenth century.

However, as a history of ethical speculation in England at the time, Mr. Stephen's review of the moralists strikes one as defective in several ways. No explanation is offered of the remarkable fact that the philosophical activity of the English mind was directed so predominantly into the line of ethical speculation, not slackening here even when about the middle of the century intellectual speculation was struck with sudden collapse. The review is also too abruptly ended and is more abruptly begun; in particular, no attempt being made at the beginning to show the relation in which the different ethical efforts of the eighteenth century stood to earlier English efforts in the seventeenth. Again by classing together under the one head of 'Utilitarians,' moralists so different as Hume on the one hand, and Locke, Waterland, Tucker and Paley on the other, the common prejudice against Utilitarianism, as if it were a system of selfishness, tends to be confirmed. And the principle itself which guides the whole exposition—that the philosophical inquiry into the grounds of right action was determined by the weakening of the religious sanction—seems to come short of expressing the facts, both first and last, or even is rather obviously at variance with some of them.

The strong point of the English mind in theoretical philosophy, as Mr. Stephen remarks early in his work, is its vigorous grasp of facts, its weakness is its comparative indifference to logical symmetry. Not less characteristic has been the English habit of thinking always with some view to practice, and making the theory of practice its chief philosophical concern. Far back in the days of the Middle Age, when the Church drew to itself the intellectual service of all the western peoples, and there was but one philosophy—Christian and European, the national tendency above all things to moralise already betrayed itself in English Schoolmen like John of Salisbury, and Roger Bacon anticipated that conception of knowledge as subservient to human practice which another Bacon is supposed to have first disclosed to the world.[1] The later utterance by Francis Bacon, coinciding with the beginning of the modern era of philosophical thought when the nations each went their own way, was indeed so peculiarly impressive that his countrymen are not unnaturally thought to have been ever since bound by its spell; but it is nearer the truth to see in the great preacher of Induction only the representative for the time of the national habit of thinking. Hobbes, who owed nothing to Bacon, and took nothing from him, was not less practically minded in his deductive speculations, having never absent from his view the regulation of human conduct in society even when dealing with the most general aspects of knowledge. Nor was Locke, who owed no more to Hobbes than Hobbes to Bacon, but with sturdy originality worked out his inquiry into human knowledge as an English counterpiece to the Cartesian philosophy reigning abroad, a whit behind either in his recognition of morality as "the proper science and business of mankind in general," while the useful arts should be the concern of special experts in default of a "scientifical knowledge" of nature not to be attained by human faculties. Berkeley, again, speculated with a moral or religious, at all events a directly practical, object in view; and Hume's Moral Philosophy remains the most serious, as by himself it was the most cherished, of his achievements. What a moralising vein pervades the general literature of our country, to the sacrifice of artistic aim, has not seldom been remarked, though it has never been more forcibly exhibited than by Mr. Stephen himself in describing the literary activity proper of the period. It is intelligible, then, or at least it is not surprising, how varied and constantly renewed should have been the attempts by English thinkers of the eighteenth century, smaller as well as greater, to determine the reason and aims of human conduct, and how they should have been continued at a time when abstract metaphysical inquiry became paralysed; more especially since the psychological impulse, which has told so markedly on the development of ethical thought in England, went on as we have seen steadily gathering strength, unaffected if not reinforced by the circumstances of the philosophical dead-block.

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[1] The relation of the later to the earlier Bacon is shortly but effectively indicated in the introductory Lecture delivered by Prof. Adamson at Owens College in October last: *Roger Bacon; the Philosophy of Science in the Middle Ages* (Manchester: Cornish, 1876).

With such a determination of the English mind towards practical philosophy, even as exhibited in the eighteenth century only, it is in any case hardly to be expected that then for the first time ethical inquiry should all of a sudden begin; and yet this, it must be said, is the rather misleading impression given by Mr. Stephen's chapter on the moralists. It is true he alludes at starting to Hobbes's bold speculations on morality launched in the middle of the previous century, but he does not suggest, as in the interest of historical understanding he might even have impressed, the fact that some of the most characteristic ethical positions of the later time were already taken up at the earlier. For example, the so-called Intellectual School of Clarke, Wollaston, and Price (of which, by the way, the shortcomings are much more effectively exposed than its serious scientific import is acknowledged) is treated without any reference to Cudworth; though Cudworth, besides enunciating all the most distinctive doctrines of the school—as Price, by borrowing wholesale from him rather than from Clarke, allows—was the author even of the "magniloquent trick of language about the eternal and immutable nature of things" which Mr. Stephen declares to be the sole relic that survived its decay. It is also a real omission, in tracing the origin of

Utilitarianism, whether in its stricter sense or in the looser sense of Hedonism adopted in the heading of Mr. Stephen's section, to make no reference to Cumberland, who has been not untruly described as the first philosophical moralist that appeared in this country, and who certainly did (to whatever dreary extent) reason about the grounds of human conduct in the spirit considered most essentially English. If a period is to be understood historically, it must not be taken too strictly, at least *a parte præ;* and unfortunately it is just in dealing with the moral philosophers that Mr. Stephen confines himself with exceptional rigour to his century, thereby not a little reducing the value of the very part of his work that otherwise comes nearest to fulfilling the conditions of a history of philosophical thought.

It is impossible also not to regret the confusion caused by classing under the one head of Utilitarianism all those moralists who in any way make the rule of right dependent on the promotion of happiness. Of course, this use of the term may be justified, because, in strictness, it applies equally to the selfish pursuit of one's own happiness and to the conscious regard for the good of all; but nobody knows better than Mr. Stephen, or indeed has better set forth on the whole, the distinctive character of that ethical view which was lifted at once into importance by the genius of Hume, and has later become so identified with the English name in practical philosophy. Neither in a theoretic nor in any other point of view is justice done to Hume's serious attempt to find a rational explanation of morality when he is ranked with theological moralists like Waterland, who solves all difficulties by direct resort to the supernatural sanction, or even with Locke, who in a more round-about and uncertain way has recourse to the same constraining authority. How greatly concerned Hume was to prove the natural existence in man of altruistic sentiments is so clearly apprehended and plainly set forth by Mr. Stephen, that from him at least we have a right to expect no such indiscriminate classing as may tend to obscure the most fundamental distinction. Not only, however, is the loose classification made, but, in his eagerness to show how much better the system of altruistic (but dependent) morality can now be based, we find Mr. Stephen carried to the length of committing an injustice. When he says that "later writers of the Benthamist school generally show a reluctance, as did Bentham himself, to admit the possibility of a perfectly disinterested emotion" (ii. p. 105), he says what it would be difficult to make good of any later utilitarian of philosophical standing. And speaking of Bentham, it is surely by an arbitrary exclusion that the author of the *Principles of Morals and Legislation* (written before the year 1780) is referred to the present century. Though there is truth in the remark that "the history of Utilitarianism, as an active force," belongs to the nineteenth century, at least as regards civil legislation, yet nothing is more characteristic of the history of English thought in the eighteenth century, than that in the last generation of it there should have been formulated those principles of public and private right of which so revolutionary an application was destined in time to be made. Nor if it should be granted that Bentham's utilitarianism, as an attempt to base morality upon observation, reduces it "to a mere chaos of empirical doctrines," as much as Hume's, is this anything but a reason for associating it with the work of the eighteenth century. There would be more reason, indeed, from Mr. Stephen's point of view, in referring even the younger Mill to the eighteenth, than in taking the opposite course with his great master in politics and morals.

A few remarks, in conclusion, seemed called for on that conception which, if it can hardly be said in fact to guide, yet stands in the front of Mr. Stephen's treatment of the moral philosophers. Were the manifold ethical theories that sprang up in the century all so many attempts to find a secular rule of human conduct in default of the decayed or decaying influence of theological precepts? The notion undoubtedly fits some of the facts and involves a general truth. Ethics, so prominent a department of the ancient philosophical systems, was of all the more obvious subjects of rational speculation the least cultivated when, after the long centuries of faith without thinking, the Christian doctors of the Middle Age began to think about their faith. Not that the practical rule of life was made a matter of no concern; but it had been provided so expressly by supernatural authority that there could be no question except as to how it should be applied in the varying circumstances of the human lot. Hence all such reasoning as there was about human conduct assumed the form and the name of Moral Theology, while the complementary doctrine of Natural Theology was but a part, however large, of the theoretic philosophy of the time. Theology stood for the whole of practical philosophy; and thus in no direction—not even that of positive physical science—could the modern spirit, when it awoke, break away more decisively from the bondage of scholasticism than by entering on the path of ethical inquiry. Every great ethical system that has since been given to the world has truly been an attempt to find a strictly rational law of conduct. Such were the systems of Spinoza and Kant, and such also was the system of Hume. Such even, as Mr. Stephen might fairly contend, was the character of some of the minor ethical doctrines which he passes under review. But hardly will his reader carry away the impression that the English moralists of the eighteenth century generally had reached the stage of philosophical detachment from the old theological basis. Had the "vision of God" become faint in Butler—Butler to whom conscience was truly the voice of a supernatural judge, and whose psychology was the controversial buttress of his ethics rather than its philosophical foundation? Was Clarke the less a Schoolman in spirit because he lived in the days of Newton, and affected the form of scientific demonstration? Or was Paley satisfied that the truth should be told without the fear of hell and the hope of heaven? Mr. Stephen must drop out of view all but two or three of his English moralists before he can see in the eighteenth century the clear beginnings of that determined search for a naturalistic ground of ethics which is being pursued in the nineteenth, but not even now is admitted without protest and resistance.

The truth, perhaps, is that Mr. Stephen, who is always as much a critic as an historian and, what is more, a critical thinker anxiously concerned about the speculative issues of his own time, has been somewhat over-ready to see the present in the past, and to reckon with the long departed as if they were adversaries or allies. This fault, if it is one, he can best expiate by writing another work, that not only will give better scope for the exercise of his special faculty but will be the more valuable according as he gives it free play and does not scruple, while tracing the currents of opinion, to direct them to the utmost of his power. Let him give us that critical History of English Thought in the Nineteenth Century which the very defects as well as the excellences of his present volumes mark him out as signally able to essay.

THE PHYSICAL BASIS OF MIND.[1]

UNDER this title Mr. Lewes, in his new volume,[2] passes from the general part of his philosophical task to deal with the more special 'Problems of Life and Mind,' and delivers himself on various questions that have lately engrossed much attention. Prominent among these is the question of so-called Animal Automatism, and it is proposed in the following pages to offer some remarks on the subject after considering his handling of it; but first it is necessary, as well as due to Mr. Lewes, to take account of other parts of the volume, which contain the results of long-protracted inquiry.

In this country at least, Mr. Lewes holds an almost unique position. He is a philosophical thinker and psychological inquirer who is also a practical worker in physiology; or he is a physiologist whose positive investigations of the innermost phenomena of organic life are guided by trained psychological insight and an ever-present regard to philosophical principles. In either aspect of it, his activity is of prime interest to all who at this present time are concerned about the problems of Life and Mind. Physiological specialists, who naturally are every day more and more encroaching on the psychological domain, may draw much enlightenment from one who knows how to speak their language as well as the other; and psychologists, who have to endure many a sneer for their readiness to eke out subjective observation with second-hand objective discoveries, may repose special confidence in a fellow-inquirer who accepts no physiological results that he does not himself verify. Those parts, therefore, of his present volume where he appears most distinctly

[1] *Mind*, iii. 24.

[2] *The Physical Basis of Mind*, with illustrations. Being the Second Series of *Problems of Life and Mind*, by GEORGE HENRY LEWES. London: Trübner & Co., 1877. (Vol. i. of the First Series, *The Foundations of a Creed*, appeared in 1874, and vol. ii. in 1875.)

in his double character of physiologist and psychologist, or prepares the way for assuming it, have the strongest claim on our attention here. A short preliminary survey of the volume will make plain what they are.

We have first a series of discussions on 'The Nature of Life'. Since it is animal organisms that manifest mind, a clear view of the distinctive character of vital organisation is naturally the primary requisite for understanding that special form of life which mind is. Towards the general argument of his volume, Mr. Lewes here more especially contends that no mechanical expression can ever adequately represent the processes of life; he also impresses, for use later on, the very important distinction between Property and Function which he had the credit, nearly twenty years ago, of first bringing clearly into view in the physiological science of the present generation. The consideration of vital phenomena is then brought to a close in a long chapter on Evolution, which aims at showing that a struggle for existence is maintained not only among organisms but also among their component tissues and organs, and that the unity of type in organisms is rather to be explained by all-pervading laws of Organic Affinity than by Mr. Darwin's supposition of Unity of Descent. The next section is concerned with 'The Nervous Mechanism,' and contains much destructive criticism of current scientific doctrines, followed up by an exposition of such general notions of the structure and action of the nervous system as the author believes can be affirmed in the present imperfect state of knowledge. Then follows, under the heading of 'Animal Automatism,' a somewhat varied collection of dissertations—historical, abstract, polemical—directed to the assertion of "the biological point of view" against a purely mechanical one in treating of mind as related to the living organism. And last, within the present volume, 'The Reflex Theory,' which forms so great a part of the prevalent doctrine of neurophysiology, is subjected to an elaborate consideration from the same "biological" point of view, taken as it had already been by the author in regard to this particular question when he wrote his well-known popular work *The Physiology of Common Life*.

The last two "problems," while intimately connected, arise naturally out of the "problem" of the Nervous Mechanism as treated by Mr. Lewes, and must be approached through it. On the other hand, the preliminary discussion on the Nature of Life, if its general import is kept in view later on, need not here detain us. Not the least interesting portion, it may only be remarked in passing, is that in which Mr. Lewes seeks to generalise the principle of Natural Selection by extending it to the organised elements of composite animal organisations; as he had already some years ago proposed to amend Mr. Darwin's theory in another direction, namely, by supposing Natural Selection to proceed upon an indefinite number of original protoplasts emerging under similar conditions, instead of the four or five or even one considered by Mr. Darwin himself at once necessary and sufficient to account for all the variety of related organic forms. Mr. Darwin, in reply to the earlier criticism, has admitted (*Origin of Species*, 6th ed., p. 425) the possibility that at the first commencement of life many different forms were evolved, but thinks it may be concluded that in that case only a very few have left modified descendants. One would gladly learn his opinion of the extension now proposed of his famous theory. Perhaps it may be guessed that he would decline to load the theory with an application so purely speculative, and not unreasonably, considering the difficulty of its verification even within the original limits. It cannot, however, be denied, in view of what is already known of the composition of organisms from living elements, that the question of the origin of species is but one aspect of the general question as to the development of life, and Mr. Lewes does good philosophical work when he raises it in its full implication.

As regards the Nervous Mechanism, Mr. Lewes has long been known to hold unfashionable opinions, which now at last receive a formal expression. He confines himself for the present, indeed, to the more general aspects of the nervous system, reserving the question of the functions of the brain till the physiological exposition can be accompanied by the necessary survey of psychological processes; but, as it stands, his treatment is fraught with observations of deep import to the psychologist. Mr. Lewes is persuaded that a great part of the current doctrine, confidently propounded by anatomists and physiologists and implicitly received by too confiding psychological inquirers, is either wholly baseless or at least not yet based on actual experience. An imaginary anatomy makes fibres run into cells and cells prolong themselves as fibres in a way that no eye has ever seen, all because of a physiological prepossession as to the part played by these particular elements in the nervous system. It is by an over-simplification of the system that these elements are singled out from the whole mass of it, and the proper scientific task of analysis is again overdone when division is arbitrarily made of the system into sides and parts, which are credited with such diverse characters in separation that it becomes impossible to understand how they should form together a system the most coherent and uniform that is. It is difficult not to allow the force of Mr. Lewes's objections against many of the most fundamental positions in the reigning doctrine of neuro-physiology, and the vigour of his criticism, informed as it is by the practice of original experimental work, bespeaks attention to the doctrine (given in outline) which he would substitute, at least provisionally, for the too definite teaching of the schools. Some of his more characteristic views, not now expressed for the first time, have indeed already begun to modify the traditional dogma in the minds of younger physiologists.

The key-note of his doctrine is the assertion of uniformity of structural plan and mode of working in all parts of the nervous system, high and low. This is not denied, or is even affirmed, in so many words, by physiologists in general, but they are apt to couple any such assertion with others which to Mr. Lewes seem to rob it of all its significance—as, for instance, that the action of the lower centres is purely reflex or mechanical; that the action of the higher centres differs in being conscious action; that particular nerve-cells are sensory or motor, or even sensational, or ideational, or emotional; and the like. Not that he either pretends that there is no distinction in the action of the different parts; there is undoubtedly the most marked difference of function or *use*, according as the various collections of nervous elements, distinguished as particular nerves or centres, are connected with different structures in the bodily organism. But this circumstance only makes it the more vitally important, for the comprehension of the system generally, to signalise the fundamental identity of character pervading all its parts, and this Mr. Lewes does by distinguishing (after Bichat) Property from Function, and maintaining that the elements of the system in all their variety, both as elements and when aggregated, manifest everywhere one perfectly characteristic property. This property he speaks of under the two names of "Neurility" and "Sensibility," according as it is presented by the nervous lines branching out towards the periphery or by the parts distinguished as central; but, however named, we are to think of a purely objective quality, symbolising a multitude of changes expressible ultimately only in terms of motion. Thus understood, the conception undoubtedly helps to a clear understanding of the whole system of neural processes, which is otherwise apt to be misconceived from the fact that our conscious mental life is obviously related to some of the processes rather than to others, or to some more than to others. There is, besides, positive evidence that native property survives functional appropriation in the well-known facts, established by Vulpian and others, of function becoming experimentally reversed; and Mr. Lewes would even suggest in one place (p. 282) that the same fibres which carry impulse out to the muscles may transmit the muscular reaction as a recurrent stimulus inwards to the centres—a view which, if it could be maintained, would help to reconcile the notoriously opposite interpretations of the muscular sense now prevalent. He also gives due prominence to all the facts tending to show that nerve-fibres are not merely passive carriers, and that the grey matter (for example, in the spinal cord) performs the work of transmission as well as any fibres.

Next to the fundamental uniformity of plan and process throughout the nervous system, it is the actual coherence and solidarity of its parts with unity of action that Mr. Lewes is most concerned to establish against the exaggerated "analysis" of the common physiological view. He objects to the distinction of peripheral and central parts as artificial, protests against the opposition of sensation and motion if taken to imply the independent and unrelated working of two sides in the nervous system, and seeks above all to bring into relief the diffuse character which nervous disturbance is prone to assume with the effect of implicating the whole organism. He does not, of course, overlook the salient feature of the nervous system known as "isolated conduction," or forget how mental growth through experience depends upon restriction of the original "irradiation"; but he is utterly sceptical as to the efficiency of the medullary sheath which is commonly assigned as the means of insulating the ultimate nerve-lines, while refusing, in the present state of knowledge or ignorance, to hazard any other explanation of the fact in as far as it occurs. That it must not be asserted in any absolute sense, so as to imply fixity or invariability of nervous conduction, he is quite sure: "fluctuation," he is never tired of repeating, is the characteristic at least of central combinations, and this, he more than suggests, may be dependent on the presence of a structural element for which no allowance has been made in the current physiological theories, namely, the so-called Neuroglia. According to some a kind of merely connective tissue, affording mechanical support to the true (fibrous and cellular) elements of the nervous system while itself not neural, this "nerve-cement" seems to Mr. Lewes, whether called neural or not, to play an essential part in all the processes of the system and probably a more important part than even the nerve-cells (p. 246).[1] In any case, until the network of the Neuroglia is better understood and duly taken into account, there can, he maintains, be no thought of having a theory of the working of the nervous system satisfactorily based, as it should be, on the ground of elementary anatomy. Meanwhile Psychology, in the way of objective help, must be content with such general knowledge as anatomy already affords of continuity and coherence in the nervous system, and for a notion of the physical conditions of mental life must rely rather upon the researches of physiologists and pathologists.

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[1] Wundt (*Physiol. Psychologie*, p. 29), after a short anatomical description of the Neuroglia in his text, disposes of it physiologically in a footnote. He mentions that the body of it, while enclosing cells that are clearly not nervous, has itself a constitution somewhat resembling the protoplasmic contents of ganglionic cells, and that many observers (Wagner, Henle, &c.) have thereby been induced to consider it as nervous in character. But this view, he declares, is wholly at variance with all that is known of the relations subsisting between the fundamental nerve-elements, *viz.*, the ganglionic cells and nerve-fibres.

The general representation of the working of the nervous mechanism which Mr. Lewes accordingly proceeds to give at the end of this part of his inquiry, strikes one as marked by a happy mixture of boldness and circumspection. It is, of course, only provisional as well as general, but the way in which he manages, by a comparatively simple theory, to order the chief facts and to suggest consistent explanation of special difficulties, deserves warm acknowledgment. Without following him into his formal expression of laws, some notion may here be given of his view of nervous action by quoting a passage that brings its main points into relief through an apt and instructive simile:—

> "Imagine all the nerve-centres to be a connected group of bells varying in size. Every agitation of the connecting wire will more or less agitate all the bells; but since some are heavier than others and some of the cranks less movable, there will be many vibrations of the wire which will cause some bells to sound, others simply to oscillate without sounding, and others not sensibly to oscillate. Even some of the lighter bells will not ring if any external pressure arrests them; or if they are already ringing, the added impulse, not being rhythmically timed, will arrest the ringing. So the stimulus of a sensory nerve agitates its centre, and through it the whole system; usually the stimulation is mainly reflected on the group of muscles innervated from that centre because this is the readiest path of discharge; but it sometimes does not mainly discharge along this path, the line of least resistance lying in another direction; and the discharge never takes place without also irradiating upwards and downwards through the central tissue. Thus irradiated, it falls into the general stream of neural processes; and according to the state in which the various centres are at the moment it modifies their activity" (p. 284).

A notable feature in this view is the treatment of Arrest as but another aspect of Discharge, whereby he gets rid of the complex machinery of inhibitory centres which has become so troublesome in recent physiological theory; but instead of dwelling on this or any other of the interesting questions raised by Mr. Lewes, it must suffice to direct the attention of psychological students to the whole of this closing chapter on the Laws of Nervous Activity, and we may now pass to the third and fourth "problems". Thus far Mr. Lewes has been treating the nervous system from the anatomical and physiological point of view. Only in the chapter where he introduces his use of the word Sensibility to mark the common property of nerve-centres (as opposed to the common property of peripheral nerves, which he calls Neurility) is he led to refer to the subjective aspect of nerve-processes which, he does not deny, is unavoidably suggested by the word. In spite of the ambiguity he deliberately makes choice of it to designate the objective quality he has in view, and he believes he has his reward in evading, with it and its companion-term Neurility, the more seriously confusing associations of the alternative name Nerve-force. For the subjective aspect of Sensibility he proposes, or rather at once claims as a matter of course, to use the word "Sentience"; and, though in the chapter itself he somewhat curiously interchanges the words as if they meant not only the same thing in different aspects (which he afterwards seeks to prove) but quite the same (subjective) aspect of the thing, yet, on the question of principle, he is most impressive in his distinction of the two aspects, and, while indicating as clearly as possible the respective tasks of physiologist and psychologist in the matter, he confines himself in all the remaining chapters of his second part strictly to the objective view. In the last two parts of the volume, on the other hand, it is the subjective phase of mind that is uppermost—not indeed as viewed in itself by the introspective psychologist but (in accordance with his main title) as that of which the nervous mechanism is the "physical basis". The amount of controversial matter in these two parts makes it somewhat difficult to take an orderly critical survey of his positions. On the whole it seems best to work into his meaning through the discussion of the Reflex Theory which he himself takes last, keeping in view, where necessary, the more general considerations ranged under the head of Animal Automatism.

What is the precise import of the Reflex Theory as understood by physiologists, who do not as a rule trouble themselves much about the full psychological implication of their statements,—may be a matter of question; but Mr. Lewes takes pains to leave us in no doubt as to the counter-theory which he, with his face distinctly set towards psychology, would substitute for it. While the current theory seems to him to assert dogmatically that the nervous processes in lower centres may and do pass as purely physical (or, as they are called, mechanical) changes without having any psychical aspect whatever, he contends that every central nervous process, to the very lowest and simplest, in any organism, intact or truncated, that is not dead, has in and for itself its proper psychical phase or aspect, as much as the highest and most complex cerebral process accompanying or accompanied by that which all understand as a conscious experience. He does not say that the psychical state concomitant with the action of a lower centre is a conscious state—either that the centre is itself endowed with consciousness or that the man or animal is conscious in the case; as indeed, for that matter, he denies that the centres immediately concerned in the higher cerebral process are in themselves the seat of consciousness, or that the man or animal need always be conscious in *this* case. But he does assert that in the one case as well as the other there is, besides the physical, a real psychical occurrence which is to be understood in terms of "Feeling" or subjective experience. He commits himself, for example, to the general statement that "Feeling is necessary for reflex action" (p. 435), meaning this at all events, that whenever and wherever a central nervous process goes forward in a living organism there always is present something that may be called Feeling. His favourite expression, however, is that the centre has Sensibility; and, though he may have wished elsewhere to understand by Sensibility a purely physical or objective process—something wholly expressible in terms of matter and motion—here, there can be no doubt, he means by Sensibility a subjective condition as well. This is abundantly clear when, in the course of his argument, he claims for every active centre a power of Discrimination, Memory, &c.; or if it be said, as is sometimes half implied (p. 463), that these terms may after all be understood objectively—*e.g.*, Discrimination as meaning only "neural grouping"—*cadit quaestio*. No upholder of the Reflex Theory, even in Mr. Lewes's statement of it, denies that the centres perform a work of neural grouping, or that, as a plain matter of objective fact, there does appear an "adaptation of the mechanism to varying impulses".

The theory he opposes has, according to Mr. Lewes, nothing to rest on but a mere prejudice as to the brain alone being the seat of sensation. When the actual facts observable in animals (with or without brains) are fairly weighed, especially in the light of what is known of the structure and laws of the nervous system, the theory must give way to a truer representation of the behaviour of the living organism. Presumption against presumption, it is quite the opposite view that is suggested by way of general deduction before looking at the particular evidence. The nervous system, as we saw, has a uniformity of structure and working everywhere, and is also in the truest sense a coherent whole. In as far as it is possible at all to speak of separate action of its parts (this or that centre) in their natural state of union, the processes in all of them appear exactly similar; and, in fact, a process set up anywhere may always implicate the whole system, and through this the organism generally. A reaction of the general organism being the natural outcome of every stimulus, the particular reaction that is at the moment possible for each, amid the multitude of impressions always being received, will determine the character it assumes subjectively. The same kind of impression that at one time appears as a conscious state specially attended to or distinctly felt, may at another time in the crush of impressions not come into consciousness at all; but in being thus unconscious, it does not cease to *be* subjectively—it does not lapse out of the domain of Feeling, for at any moment it may again acquire the character of a conscious sensation, if the brain is not otherwise engrossed. So, if the brain is removed altogether without loss of life, we are not to suppose that such reaction as is still possible in the organism has no longer any psychical character, merely because it can no longer appear as it did to the animal that was conscious through the brain. Indeed, if we turn to the actual facts, "instead of marvelling at the disappearance of so many modes of sensibility when the brain is removed, our surprise should rather be to find so many evidences of sensibility after so profound a mutilation of the organism" (p. 439). The facts warrant, according to Mr. Lewes—especially those placed under the head of Instinct (pp. 463 ff.)—precisely the same *kind* of inference as is forced upon an observer by the deportment of animals in their intact state. With Pflüger, he urges that it is only by inference from objective signs that we ascribe subjective life to any other man or animal, and where the signs, though in the absence of the brain, remain precisely what they were, the inference is not to be evaded.

There is no need to follow Mr. Lewes into his interpretation of the facts, as far as he adduces them, in detail. The point of real significance is to understand the general reason why Sensibility in its full meaning—not as mere "Neural grouping"—should be so expressly claimed for the spinal cord. Or it may be said that everything depends on the use to be made of the concession, supposing it were not withheld; for if it is true that the claim can never be proved, it is equally true that it admits of no positive disproof. First, however, we must seek out the true meaning of the Reflex Theory, to see what is the real difference that separates Mr. Lewes and its upholders.

The Reflex Theory, though often enunciated in an incautious or in a half-hearted way, is at bottom nothing but an assertion that, wherever there is nervous stimulation followed by nervous outcome (appearing as movement or otherwise), there is a continuous physical process through the central parts involved, and no hyperphysical or metaphysical agency is to be assumed there for the explanation of the forthcoming result. When first formulated, the statement was confined to the lower centres, but this may have been rather because the processes in these were simple and could be approximately traced than because the cerebral processes were believed to be disparate in kind, that is to say, physically discontinuous, by reason of the intervention of a non-physical agent (the conscious ego) at the higher centres. Or, if indeed some, nay many, assertors of the Reflex Theory have limited it to the spinal column and more immediately connected parts, under some such notion (more or less vaguely expressed) of a difference of conditions in the brain, this is a weakness or misunderstanding which clearer heads have been able to surmount with the gradual advance of physiological knowledge. The doctrine of Animal Automatism, as Mr. Lewes himself remarks (p. 389), is only the Reflex Theory legitimately carried out; at least, it includes the assertion that all central nervous processes whatever, high as well as low, are physically continuous—that the "nervous arc" is unbroken in the brain just as in the cord. When, therefore, Mr. Lewes urges elsewhere (p. 453), as one objection against the Reflex Theory, that there are cerebral reflexes as well as spinal reflexes, he urges that which consistent supporters of it are themselves most forward to maintain. He does not differ from them seriously even when he would urge that, as cerebral processes in another aspect of them are mental processes, so some kind of mental process may always be assumed as the obverse aspect of a spinal reflex: they do not assert this, but neither do they deny it as a matter of fact in what they do assert. He differs from them radically only if he maintains that Reflex Action is made what it is through the agency of Feeling—that "Feeling is necessary for Reflex Action" in the sense that without the presence or interposition of feeling reflex action cannot be conceived as proceeding.

Now it is impossible to doubt that this or something very like it is Mr. Lewes's meaning, and that he evidently thinks he thereby makes a distinct advance towards a scientific comprehension of Mind. This is the object he has in view throughout his whole argument, and not the gratification of any mere fancy for harmonious philosophical expression. Others have indulged in speculation as to an unconscious mental life bound up with the action of the spinal cord, and, not stopping there, have interpreted in an analogous manner the vital processes in plants and completed their philosophical sweep by supposing every change or motion in the physical world to be in some shadowy fashion the direct manifestation of a mind or mental principle. Mr. Lewes does not go so far a-field. He founds no argument on the so-called sensitiveness of plants, to say nothing of simpler physical processes; he does not assert that wherever the property of Neurility is manifested, as in detached portions of nerve, there we must also assume the presence of some sort of subjective feeling; nay, even when there is distinct "neural grouping," and thus evidence of the *objective* property of Sensibility, as when the cheek of a guillotined victim responds with blushing to a stroke, he scouts the notion of the blow being felt (p. 439). But wherever there is an animal organism, either living as it naturally lives or, however mutilated, able to retain life, all its central actions, he maintains, are what they are—actions of a living thing and not motions of a dead mechanism—only by virtue of Feeling, and if not first viewed as felt they are wholly unintelligible.

What, then, is the precise difference between a Living Organism—at least an animal organism with a nervous system—and a mere Mechanism or Machine, which renders it necessary to assume feeling as the ground of all action in the former? This is a critical question which Mr. Lewes raises over and over again within his volume, and strives to answer in the most determinate way. His answer always turns more or less upon the point that an organism is peculiar in showing selective adaptation in all its acts, that is, varying combination of motor impulses to suit the varying requirements of the effect to be at any time produced, or, as he also puts it, fluctuating combination of elements in response to variations of stimuli. This, he holds, is found in no machine; nor has a machine either that primary constitution, distinctive of organisms, which appears as their inherited specific nature, or a history, in the sense of having its primitive adjustments modifiable through development of structure brought to pass by the very fact of its working experience. Otherwise, in his many discussions of the subject, he urges that, however organisms may exhibit phenomena referable to physical and chemical agencies, they also exhibit others that can never be expressed in terms of these; and, again, that the organism is no mere mechanism, because mechanics can assign only the abstract laws of its movements, and cannot account for its behaviour in the concrete.

The statements may pass for what they are worth; but even if they were unexceptionable—which the last, for example, hardly is, since mechanics gives no more than the abstract laws of the motion of any body whatever—they yet fail to prove anything as to the efficacy of Feeling in organic processes. It is accordingly by another line of argument that Mr. Lewes really seeks to establish his general position. He does not so much build any conclusion on the shortcomings of the Reflex Theory, as reject this because he has already satisfied himself that where conscious feeling is allowed by all to be present, it determines the nervous processes to be what they are in the living organism. Here, then, we turn expressly to his view of the doctrine of Animal Automatism. An outgrowth (in its recent statement at least) from the Reflex Theory, it may perhaps be so overthrown as to uproot the Reflex Theory with it. Its central idea, now become familiar to all, is that consciousness, although present, does not count for anything in the vital history of man or animal—that all animal actions may be completely expressed and accounted for in terms of (nervous) matter and motion without the interposition of feeling as a factor at any point of the course and indeed without any reference whatever to conscious experience. Supposing this were true, there is obviously a very intelligible sense in which it can be said that everything proceeds mechanically in the living organism: not that there is no difference between a biological process and a simple physical movement, any more than there is no difference between a chemical reaction and the rebound of a ball, but in the sense that just as a chemical process can and must always be interpreted ultimately in terms of motion, so a nervous event must likewise in the end be so interpreted. Be this point of expression, however, as it may, Mr. Lewes is by no means disposed to grant the main position. He contests the ground inch by inch with Professor Huxley who some years ago gave an impressive exposition of the doctrine of Automatism, and, what is more, he enters upon a line of consideration which not only, as it seems to him, affords the deepest reason for asserting Feeling to be an agent in the vital procedure of man or animal, but also yields a strictly psychological solution of the general question of the relation between Body and Mind.

As a metaphysician, Mr. Lewes is a monist who declares that objective Motion and subjective Feeling are but two aspects of one and the same real, but he confesses that he did not always clearly see *how* a physical process could also be a psychical process. Even now, in a chapter (on Body and Mind) that is otherwise marked by great insight and subtlety of expression, there is some want of clearness or consistency in the explanation that is offered; but his general drift is unmistakable and is to the effect that what we call Matter and Mind, Object and Subject, are symbols of different modes of feeling or sentience, which may both represent the same real, just as one tuning-fork may appear moving to the eye and sounding to the ear. The two differ merely in the mode of apprehension. Still they do differ, and nobody could more impressively urge than does Mr. Lewes in this chapter (see especially p. 342, as at the earlier stage before referred to, p. 193), that there must be no mixing-up of the different aspects—that when we are talking in terms of Matter and Motion, *i.e.*, "optico-tactical experiences accompanied by muscular experiences," we must not shift about and pass over into the phase of specially subjective experience for which the comprehensive symbol is Mind, nor *vice versâ*. Thus, if by positing only a difference of psychological aspects, not a difference of substances, he is not saddled with the metaphysical difficulties of Dualism, he also, by taking the different aspects as equally independent, avoids the error of those who are prone to sacrifice the subjective to the objective aspect, speaking of the terms of the physical series as the causes of the corresponding psychical terms in a sense which does not admit of being reversed —as if, that is to say, the one were always to be absolutely assumed, while the other may be considered or neglected at will. And yet he is perfectly aware of the special scientific advantage there is in seeking for an objective expression of the facts of subjective experience, which, though it never should be declared a mere accident of the series of physiological processes, does yet, as subjective, not admit of the same rigour of scientific statement.

This, then, is the argument, and so far it might seem intended for the rescue of Feeling from the subordinate position to which it has too often been improperly consigned, and the establishment of a thorough-going parallelism of the physical and psychical; but now we have to learn that Mr. Lewes's real meaning is very different. Because the objective series of nervous processes and the subjective series of corresponding mental states may both, in ultimate psychological analysis, be regarded as modes of feeling in some consciousness or other, this is to be a reason for declaring that Feeling—meaning always a mental state in the subjective series—may and does enter as a term into the objective series, which, as properly objective, consists of molecular movements in nerve. Let the reader, in particular, refer to p. 403, where, after his long combat with Prof. Huxley, Mr. Lewes proceeds to sum up his argument on the special question of so-called Automatism. There we are reminded once again that, though we may believe Consciousness, which is a purely subjective process, to be objectively a neural process, we are nevertheless passing out of the region of physiology when we speak of Feeling determining Action: motion may determine motion, but feeling can only determine feeling. Yet we do, says Mr. Lewes, speak of Feeling determining Action, and we "are justified: for thereby we implicitly declare what Psychology explicitly teaches, namely, that these two widely different aspects, objective and subjective, are but the two faces of one and the same reality. It is thus indifferent whether we say a sensation is a neural process or a mental process—a molecular change in the nervous system or a change in Feeling. It is either and it is both." Certainly, it is here made clear why Mr. Lewes has previously permitted himself to use the same word Sensibility to express the objective fact of neural grouping and also a fact of subjective experience; but with what reason he denounces those who, when they are speaking in terms of matter and motion, cannot keep to their text but will persist in dragging in terms of subjective import—is not so clear. Why should they not use the subjective words? How do they go beyond the reckoning, when it is exactly the same thing they are speaking about in the one language or in the other? Or is Mr. Lewes's meaning this—that the physiologist indeed must keep, like any other physical inquirer, to the sphere of the objective in which he finds himself and which he cannot explain, but the psychologist is at liberty to pass at will between the subjective and the objective spheres because *he* knows and can prove them to be one in reality? If this be so, surely the psychologist's fate is hard. Alas for his insight if it must be the death of his science—if it shows him the same thing with two different sides to be named and will not suffer him to speak consistently about either!

Now let us note, before closing the account, two other positions taken by Mr. Lewes that are in different ways remarkable. One is where he declares at the end of his whole argument (p. 409), that "the question of Automatism may be summarily disposed of by a reference to the irresistible evidence each man carries in his own consciousness that his actions are frequently—even if not always—determined by feelings. He is quite certain that he is not an automaton and that his feelings are not simply collateral products of his actions, without the power of modifying or originating them." And Mr. Lewes adds, "this fundamental fact cannot be displaced by any theoretical explanation of its factors". One reads the words with a certain surprise. There may be reason indeed for protesting against such an incautious statement as that feelings are "products" of (nervous) actions: all that Mr. Lewes urges anywhere against attempting to explain the psychical series as dependent on the physical series, is much to the point. An Automatist who contends for pure parallelism of the physical and the mental, must no more think of breaking the mental line for the physical than the physical for the mental, nor has he a right to view the mental as a discontinuous efflux from the unbroken chain of nervous events. But the bare suggestion that any scientific deliverance on the subject can be based upon the immediate evidence of consciousness, is somewhat confounding when it comes from Mr. Lewes. The end of that kind of reference in questions of philosophy is but too well known. If it were allowed in this particular case, what becomes of the parallelism of aspects which nobody maintains more strongly or on deeper grounds than Mr. Lewes? He would break it in one direction as much as he charges Prof. Huxley with breaking it in the other. But, indeed, from the point of view of direct consciousness, what question is there of a parallelism at all? That a nervous process represents one purely phenomenal aspect of what, on another purely phenomenal aspect, is a conscious mental state, may be a very profound truth, but it never was ascertained on direct evidence of consciousness, which, in the sense in which it ever may be said to take account of nervous processes, views them as physical changes in a material structure supposed to exist apart. Nor, whatever reason or excuse there may be for the natural conviction we have as to a relation between feeling and bodily action, can this be allowed to affect one way or another the validity of the philosophical interpretation.

The other statement referred to occurs at an earlier part of the argument, but is here taken last because it gives occasion for the few remarks on the doctrine of so-called Automatism which will bring this article to a close. Can we translate all psychological phenomena into mechanical terms? asks Mr. Lewes at p. 352, and he replies (for reasons before mentioned) that we cannot—"nay, that we cannot even translate them all into physiological terms . . . nor can the laws of Mind be deduced from physiological processes, unless supplemented by and interpreted by psychical conditions individual and social". It is important to take account of this last remark (though it is not followed out at the place or anywhere adequately enforced throughout the discussion), because otherwise the denial of the possibility of expressing mental phenomena in physiological terms would stand in sharp contradiction with all that the author so often says about neural and mental processes. Plainly he cannot mean that there is not an exact physiological expression (if it could be obtained) for every psychological phenomenon. He rather means (I can only suppose) that just in the sense in which a biological phenomenon is more than a chemical one, so a psychological phenomenon is more than a biological. And this is a most important consideration, which if fully grasped may lead us to see that the notion of Automatism fails to express just that which is most characteristic in the life of Mind. But for this a little explanation is necessary.

It was said above that there is a sense in which the expression of biological phenomena in purely objective terms of motion may be called a mechanical view of them. Does this mean that from the principles of mechanics it is possible to deduce the phenomena of life? Not at all. It only means that, as life is manifested by a material structure, no vital change, when it happens, can be interpreted otherwise than as some more or less complex phenomenon of motion. More immediately, in many cases, the vital change may have to be phrased as a chemical process, but this, it is not denied, is a peculiar mode of motion—some re-arrangement, let us say, of atoms in space; and mechanics (or general physics) contains the laws of all such change of position. Of course there is nothing absolute or final in such an expression of chemical and biological phenomena. Even supposing we could assign to the minutest particular all the motions or re-arrangements in space that constitute a chemical or a biological phenomenon—supposing, that is to say, we had found the complete physical or mechanical expression—it would still remain a problem to find the purely mathematical expression of this physical expression; and, again, the full mathematical expression, if it could be found, might be viewed as the result of a conceivable logical combination. But short of this last stage, at which the problem ceases to belong to objective science, it has come to be thought sufficient in modern times to find the mechanical expression for any material phenomenon, because motion admits of definite measurement; and hence the idea that such an expression constitutes an ideal explanation. However, just as the laws of motion cannot themselves be deduced from mathematical principles without data from experience, so, I repeat, there is no question of merging chemistry or biology in physics, in seeking for a mechanical interpretation of chemical and vital phenomena. Chemical processes must be investigated in the special conditions under which they appear in our experience—only always in the light of physical principles; vital processes likewise—only always in the light of physical and chemical principles. And so also mental phenomena, while studied in the light of biological principles and the others implied in these, have to be investigated in the special conditions that are found to determine them. They doubtless admit of translation into physiological terms, but physiology can never explain their rise.

Now the doctrine of Automatism declares that the state of the living organism, more particularly the nervous system, is at any moment the effect of its state immediately preceding and the cause of its state immediately succeeding; just as an automaton, or mechanism involving some internal principle of motion, goes through a series of operations each of which in turn brings on the next. As a matter of fact, the various nervous processes, as they are successively brought to pass, have or may have subjective concomitants, which are called, in the cases where they excite attention, states of conscious experience; but none of these have the least real influence in determining the next condition of the organism, or (as it should be, but is not always, clearly understood and expressed) are themselves determined by the accompanying or the foregoing organic states—at least in the sense in which these are causally related to one another. Though the presence of consciousness makes the man or animal a *conscious* automaton, all the vital acts that are commonly called mental are, it is said, truly those of an automaton inasmuch as they are physically predetermined and would come to pass equally though consciousness were wholly absent. The doctrine is thus something more than a mere extension of the Reflex Theory, as it was previously described. As the name Automatism suggests, the organism is supposed to have within itself a principle of action whereby the succession of nervous processes, both cerebral and spinal, is physically determined; and the direct implication is that the life of man or animal not only may be considered as a set of purely physical occurrences, but cannot otherwise be scientifically regarded.

Now, if this is at all a true representation of the theory of Animal Automatism, it is surely quite inadequate as an expression of the facts of mental life. The state of the brain or whole nervous system at any moment is always one factor in the causation of its succeeding state, but, at least in all cases where anything of the nature of a new mental experience or acquisition is involved, it is one factor only. If we consider how many and what kind of factors may co-operate in producing the physiological condition (of brain, &c.) which corresponds with that which we call (subjectively) a mental judgment—even a very simple one—we are obviously face to face with a phenomenon belonging to an altogether peculiar order of occurrence. Using the word in the first instance merely for discrimination, we have in the *mental* phenomenon something at the least as much more complex than a vital phenomenon as this is more complex than a chemical phenomenon. And whether or not there is any scientific advantage (perhaps there is not much) in likening the multiplicity of vital reactions to the reaction of an automaton, because both are motions determined largely from within,—in the case of mental phenomena, at all events, the comparison is unsatisfactory in every way. While the reference to any internal mechanical arrangement that may be devised gives, on the one hand, hardly the least notion of the marvellous organisation of the nervous system, slowly developed as this has been in and through actual working, it gives, on the other hand, an exaggerated notion of its independent activity as the organ of what is specially called Mind. For all its apparent spontaneity, the nervous system as the organ of mind works mainly in response to stimuli supplied by the natural and social environments. Even if nothing had to be said about a subjective representation of these, to overlook them as factors in the peculiar result which follows from them is to omit all that is most characteristic in the case.

But it may be said that it is no part of the doctrine to exclude reference to the external factors: what is really contended for is the right to express all the factors, internal or external, in physical terms, or rather the scientific necessity of so doing, and the right to discount all reference to conscious or subjective experience as irrelevant to the scientific issue, whatever other interest it may happen to possess. And truly, though the word Automatism is quite inappropriate as an expression for this conception, it is not for a moment to be denied that the mental life from first to last in all its phases—its potencies, its actuality, its very aspirations and ideals—admits conceivably of physical expression. But the grave mistake, nay the profound error, is to think of building the science of mind upon such a foundation—is to fancy that this way of looking at mind is the only scientific way, or even, in the actual circumstances, at all truly scientific. Would it be right to defer the study of life till physics and chemistry with mathematics are sufficiently developed to furnish a deduction of it, or, if not wholly deferring the study, are inquirers bound to refrain from establishing any facts or laws which they cannot exactly express in terms of chemistry and physics? Physiologists, by their practice, answer emphatically No, and theoretically they might urge that the chance of ever finding the physico-chemical expression of vital phenomena (to say nothing of their fully reasoned construction) depends not least on the prior ascertainment of the phenomena as vital. With what reason, then, can the impression, or even (as it may be and is) the well-grounded conviction, that mind in all its phases has its physical equivalent, whereby it is brought within the realm of objective nature and may on this side conceivably be studied—with what reason can this conviction be urged against the study of subjective mind, or be made the ground of a serious assertion that consciousness is a mere accident of a certain determinate succession of physical events, when, but as they are subjectively represented, the factors whereon the events depend could not be discerned and brought within the view of scientific inquiry? A possible assertion it, no doubt, is, and there may even be some use in making it by the way, as a means of lending impressiveness to the affirmation of the never-failing physical aspect of the mental life. But it is no serious assertion to rest in with a view to science, for the reason just given. The conditions natural and social upon which mind and the corresponding series of organic states in point of fact depend, would never come into view at all except in the guise of properly conscious or psychological experience. Only as we are first conscious of influences received from the world of nature and (through speech and otherwise) from our fellow-men, can we afterwards have any true idea of all the (physical) circumstances entering into the causation of that series of nervous positions which we may come to think of as co-existing with the flow of our subjective life. How then can this be truly described as accidental in the case? And let it be observed that here the argument is conducted strictly from the point of view of phenomenal science. We may leave out of sight that deeper philosophical consideration, according to which the series of complex physiological events itself appears in ultimate analysis as compacted of a special class of conscious experiences.

In my opinion, the Reflex Theory and the more developed Automatic Theory err not in what they really affirm but in what they are understood by many of their advocates to deny. When the Reflex Theory is supposed to mean that the nervous action of the spinal cord is in no way related to the life of subjective experience, it goes beyond the evidence, even although there can be no proof positive of the counter-assertion that every central nervous process is at the same time, in another point of view, a fact of mental experience conforming to psychological law. When the Automatic Theory is given out as meaning that conscious experience has no scientific import, it not only goes beyond the evidence but bars the way against the kind of psychological investigation that practically and theoretically can best be justified. The Reflex Theory brings into view a consideration of great scientific moment when it declares that, without the least reference to conscious or any kind of subjective experience, there is physical provision in the nervous system for the accomplishment of acts most deeply affecting the well-being of the organism. It only errs if it is understood to imply that there is no further question to be asked about such arrangements and that they cannot be at all viewed, either in their origin or in their developed form, as related to the mental life. So also the Automatic Theory advances science when it suggests as a constant problem the expression of all mental phenomena in those objective terms which can be made so much more definite than subjective expression ever is. But it impedes science when it discourages the specific study of mind in all the variety of its actual conditions and manifestations—for the sake of a premature and barren physiological deduction. Will any brooding over physiological data lead to anything but the most vague and general results in the way of psychological inference? Nobody who reflects will pretend that it can; and one must go further and deny that even the vaguest psychological conclusion can be so obtained, unless with the physiological data there be coupled unawares some data of purely psychological, which is to say subjective, experience. I would not quarrel with the theory of Automatism on the ground most commonly taken. Though it gives a very inadequate expression to the infinite variety of circumstances determining human actions as viewed objectively, people must learn to be content with the plain truth that man, however he may be "man" (which is saying much), is not "master of his fate," but has his part and lot in the destiny of that—whatever it may be—which is called the physical world. But this truth is little towards all that we want to know of our strange double-sided human existence, and we cannot know more if our scientific activity is to be limited to such abstract theorising as finds expression in the doctrine of Automatism. Mental life can never be understood either in its essence or in its fulness, unless it is studied directly alike as it discloses itself to subjective introspection and as it is manifested more broadly in social relations and in the record of history.

The conclusion of the whole matter is that Psychology, however it may be related to biology, must be upheld as a perfectly distinct science—in no sense less distinct than chemistry is from physics, and in truth much more distinct because of the transition from the objective to the subjective point of view. And, returning to Mr. Lewes who has shown himself among the first—who claims indeed in his present preface to have been quite the first—to understand Psychology as the science of Mind in its wider implications, I cannot but venture the opinion that he has not now made all the use that might have been expected of his insight in dealing with the fallacy of "Animal Automatism".

PHILOSOPHY IN EDUCATION.[1]

A TIMELY question is raised in the foregoing paper,[2] and answered with great directness and vigour. The question is opportunely raised at a time when the Civil Service Commissioners, whose sway gains with every year upon the higher instruction of the country—as new classes of appointments are thrown open to competition—have decreed that Moral Science shall cease to figure by the side of Logic in the scheme of the long-established Indian examination, giving place to Political Economy. This change was invoked with more than prophetic exactness by Mr. A. J. Balfour in the *Fortnightly Review* of August last (1877), before the issue of the revised scheme, and its significance is not the less that a year earlier another public body, the University of London, as noted at the time in these pages (No. 4, p. 577),[3] was moved in whatever spirit to throw away one of the chief distinctions of its examination-system when it ceased to require of all candidates for the degree of Bachelor of Science some knowledge of Logic and Psychology. Now comes Mr. Stewart's argument, conceived from a quite independent point of view, yet so running in part—where he puts forward Logic but makes conditions about Philosophy—that it might be read almost as a justification of the precise action of the Civil Service Commissioners (or Indian Secretary). Such an apparent consensus of opinion is too remarkable not to require some consideration of its grounds. There may also be some use in confronting with the recommendations of an Oxford lecturer those which a different kind of practical experience would suggest to another teacher. And in a journal that was founded mainly on the faith of the existence of a properly scientific doctrine of mind, it seems right not to pass over some observations that Mr. Stewart makes by the way on the character of Psychology.

[1] *Mind*, iii. 241. [2] By Mr. J. A. Stewart on same subject. [3] See above, p. 182.

First, a few words on the opinion expressed by Mr. Balfour in the course of a general argument on the Indian examination. In his judgment, Moral Science—meaning Metaphysics and Ethics—fails to satisfy every one of the conditions of a good examination-subject, while Political Economy satisfies them all. The effort of memory, he says, in mastering the subject, should be small compared with the effort of intelligence; it should be easy to distinguish an answer that shows a merely skilful use of the memory from one that shows an intelligent grasp of the subject; and there should be substantial agreement respecting the body of doctrine in which the examination is held. Waiving the point whether in this last respect Political Economy does at the present day stand in a better position than Moral Science, I should doubt whether his third condition is of as much practical importance for the ends of a selective examination as he deems it, while as to the other conditions it surely might be contended that they are very exceptionally satisfied by Moral Science. There can be no question of "mastering" this subject by effort of memory, nor will an examiner, if he knows his business, have much difficulty in judging whether a student is merely remembering or understands a philosophical doctrine. The question, however, that I should like to put to Mr. Balfour is whether it is his opinion that Moral Science should not be studied at all by the class of men whence Indian Civil Servants are drawn. If this is not his meaning, the true way of dealing with the examination should rather be to make it more stringent. What I suppose Mr. Balfour really to mean is that a smattering of philosophical knowledge is not, like some other smatterings, a harmless mental possession; and this may be freely allowed. It is an evil if hitherto men have been tempted to "get up" a little Moral Science, under the impression that it was an easy way of securing marks. Whether the marks were secured or not, the men are likely enough to have suffered mentally and morally by the venture. But the remedy is to take care, by the nature of the examination if not otherwise, that candidates shall have gone through some real and deliberate study. If it be said that this cannot be provided for, but rather the subject must be dropt out of the examination-scheme as not a "good" one (in the sense of Mr. Balfour's conditions or any other), the effect will be to confirm those people in their opinion who think that the public competitive system attains its end at a ruinous sacrifice. The mechanical exigencies of the system, thus applied, might easily prove the death of higher academic culture in the country. It may not be desirable that as many youths should take up with Philosophy as with Mathematics or even Political Economy, but those who follow the philosophic call that comes early to some should not therefore be excluded from the public services.[1]

Coming now to Mr. Stewart, I find much to agree with in his positions. It is a very senseless or even mischievous proceeding to begin the study of Philosophy with a general view of historical systems; nor could the reasons against such a course be more forcibly or accurately expressed than by him. It may also be, and doubtless it often happens, that a beginning is made with Psychology in circumstances such that the step is as inappropriate as he describes it. Neither is any fault to be found with his recommendation to begin with a course of Pure Logic: some teachers do this regularly with great advantage to their students, and even boys and girls at school, as Mr. Stewart rightly urges, may thus be led on, almost insensibly, from their grammatical lessons to a first understanding of the philosophical point of view. As little would one think of contesting his view of the general mental discipline that comes of really intimate converse with any of the master-spirits whose thought is of the cast that withstands all change of time.

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[1] It is only an act of bare justice to acknowledge that the Civil Service Commissioners show the most anxious desire to secure an effective system of examination, and to this intent are never slow to modify their practical regulations in the light of new experience. Nor can it be doubted that the present change in the scheme of examination-subjects—a far more serious matter than a change of working-rules—is meant in the interest of thoroughness. But has it been duly considered in the light of its effect upon the higher instruction of the country? The lowering of the maximum age of candidates for Indian Civil Service appointments, from twenty-one to nineteen, makes an important difference in the case of this particular examination; still the change, as affecting one of the recognised branches of academic instruction singly, is ominous all the same, and it will press hardly upon students in those parts of the country where Philosophy is studied most and earliest.

Is Philosophy, however, only such an ἦθος as Mr. Stewart would make it? The analogy with Poetry has its foundation. In the depths of your being you feel thus or thus, and if you have the gift of utterance you burst forth in measured strain, or lacking spontaneity you revel in this or that poetic creation of others. So of one's philosophy it may be said that it is simply how one tends to think of all things—the general and ultimate expression of one's intellectual personality. You cannot prove a philosophical as you prove a scientific theory: you take it or leave it. Still a philosophical, like a scientific, theory assumes to be a subjective expression of objective fact. One studies the system of a philosopher not expecting to have one's assent extorted as by scientific demonstration, but yet with the aim of being brought to a state of intellectual acquiescence. It is therefore no matter of indifference what systems of philosophy we shall study. The classical student will very naturally turn to the *Republic* or the *Ethics*, and if he really enters into the mind of Plato or Aristotle, will end by being more than a scholar; but if his first object is to obtain philosophical insight—help and inspiration in comprehending himself and the world that he knows by common or (as even a classical student may to some extent know it) by scientific experience—he is more likely to find what he seeks in thinkers nearer to his own time and circumstances. So it is very well that the "young Englishman" should learn to admire the sterling qualities of Locke's nature, intellectual and moral, as they shine forth from the pages of the *Essay*; but he may be helped to see farther into things and have more guidance in ordering his life if he will study those masters who think on a basis of better-ascertained experience, physical and psychological, than Locke did. It is the true Oxford note that is heard in Mr. Stewart's injunction—"Read a Classic". Classics, whether ancient or modern, are worthy of all regard, and it may be hoped that by this time we are all alive to the duty of assimilating into our consciousness whatever is best in the record of human thought. But the philosophical craving, once it is really awakened in any mind, is not to be satisfied by the æsthetic contemplation of a past thinker's work, be he called Locke or Aristotle. Philosophy is not therefore

Literature, because there are theoretic as well as practical grounds for distinguishing it from Science.

Even when he appears to be pleading the cause of true as against sham science, the ways of study at Oxford are still uppermost in Mr. Stewart's mind. It is in the interest of Science, not of Literature, that he deprecates the practice of beginning a philosophical course with the study of Psychology, and is led on to urge his objections against the claim of psychological doctrine to rank as scientific. These will be considered presently in their material import. Viewed in their educational bearing, their force seems wholly to depend on one assumption—that the average Oxford student with his public school training in classics or mathematics represents the case of all youths who are brought into contact with philosophical questions through the portals of Psychology. Put the case that a student, besides being fairly read in ancient or modern literature, is acquainted not only with the principles of mathematical reasoning but also to some extent with the experimental methods of physics and chemistry and even with the procedure of biology—how will he suffer in intellectual character by being set to see the processes of science brought to bear on the facts of subjective consciousness? If he knows nothing of the ways of science except what he can learn from Euclid, he may indeed be exposed to the dangers which Mr. Stewart forcibly depicts, but the fault lies with his previous training rather than with Psychology, which might perhaps, by the very nature of things, be no more strict a discipline than Mr. Stewart would make it without therefore either losing the character of Science or ceasing to be the best introduction to the study of Philosophy. It might be supposed too, from the vehemence of Mr. Stewart's argument, that in this country great numbers of students are every year being set to learn from psychological primers, and that all of them, by reason of an exclusively literary or merely mathematical training, are exactly in the condition to have their minds hopelessly perverted in the process. So far as I know, there exists no psychological primer in the language; the number of students, in England at least, that take in any way to Philosophy, is relatively very small; the number of Philosophical students anywhere in Britain that are introduced to Philosophy through Psychology is not great; and those of them who in such a case use books like Mr. Spencer's *Psychology* and Prof. Bain's larger or smaller treatises are not in general so ignorant of physical science as to be in serious danger of misunderstanding everything in the direction of Mr. Stewart's fears. At least, if they study with a teacher who himself understands, they may easily enough be kept from taking everything in an "abstract" sense—so far, that is to say, as they ought to be: physical science when it experiments, biology when it experiments or compares, neither of them can help "abstracting".

The indictment brought by Mr. Stewart against the scientific standing of Psychology comes altogether to something like this: Psychology is not a science, because it is neither abstract like Mathematics or Political Economy, nor experimental like Physics or Chemistry, nor comparative like Biology; because, that is to say, it deals neither with such a mere aspect of things as number or figure or such a separable phenomenon in social life as wealth, nor with manageable and measurable physical events, nor with organic forms which if they grow and change have an inexhaustible variety of perceptible attributes preserving fixed relations with one another at every stage. And it is all quite true: Mind is no such quality of objective things as even life, to say nothing of physical motion or figure and number. Mind is the name for just that which is most opposed to what we call objective qualities (though these themselves in ultimate philosophical analysis are easily shown to have an expression in terms of mental experience). But what follows? That there can be no such thing as true statements regarding mind as it appears in you and in me and all our kind? That your subjective experience and mine have not common limits and are not developed according to definite laws the same for us both—laws and limits alike ascertainable? That, in short, there is nothing that can be called psychological science; but if we would take heed of our inmost nature it must be in the way of personal fancy guided by the example of some classical philosopher, ancient or modern? So Mr. Stewart seems to think. But not so think all the best philosophic heads of English name for some two centuries back. Not so think in ever-increasing force the most active spirits of other countries where the philosophy of subjective fancy has taken its boldest flights. These have laboured and labour with the difficulties of subjective observation which they know to be most real, and with the graver difficulty of verifying or proving universally valid the relations which the introspective observer finds or thinks he finds among the facts of his own conscious experience. They have gradually, as the objective sciences, especially physiology, have been slowly developed, acquired the habit of giving greater fixity to their subjective expressions by connecting them, wherever possible, with phenomena of the bodily life—a practice as perfectly legitimate from the scientific point of view as anything could be. They have also, in the most recent time, come to see that mind may be studied not only in its direct bodily manifestations but also in its *products*—in manners and customs, social or religious, and in all the variety of objective phenomena that are the special care of the anthropologist and comparative psychologist; which is again a practice the legitimacy of which cannot reasonably be questioned if it results in the least grain of insight. When all is reckoned, the insight acquired is doubtless defective enough, and the most hopeful psychologists who are wise have the fullest sense of what remains to be done before the scientific title of their doctrine will gain general recognition. At present, imperfect as the doctrine is in many ways, its scientific title is denied less on that account and less on account of the real difficulties that must ever beset its procedure, than simply because its subject-matter (as its champions even more than its foes will contend) is disparate from that of any other of the sciences commonly allowed. Unfortunately, also, with this disparateness of psychological facts and with the acknowledged difficulty of verifying general assertions about Mind, there exists for every man the most perfect facility of expression respecting his own inner experience, which may be straightway taken as representative of all. Hence a popular opinion, laid hold of and systematically applied by some metaphysical thinkers, that a special or technical science of Mind is a superfluity. Mr. Stewart is not of that opinion, for he desiderates the science he denies; but the way he would have Philosophy studied seems curiously well calculated for hindering the growth of an effective Psychology.[1]

For my part, be the imperfections of present Psychology what they may, I cannot hesitate to maintain that with Psychology and nothing else the beginning of express philosophical study should be made. Whether or not it may be expected that men will agree in philosophical as in scientific matters, I differ from Mr. Stewart in assuming that it is desirable they should; because Philosophy aims at the expression of a certain kind of truth, and, though there may be different kinds of truth, there is but one truth of the same kind. Besides, it has always lain in the notion of Philosophy that the insight obtained should be subservient to conduct, and this makes philosophising a serious business in life, not a mere piece of self-indulgence. Assuming, then, that men are to be brought, as far as may be, to agreement in philosophical conclusions, I desire that the beginning of philosophical study should be made upon ground where agreement is most easily attainable, and this is afforded by Psychology. But here a particular conception of Psychology is, no doubt, implied, and this should be well understood. It is implied that Psychology, while it has an altogether peculiar matter in dealing with the subjective life of consciousness, is brought into relation through Biology with the positive sciences that deal with objective fact, and is, in its own measure, amenable to the recognised conditions of scientific procedure. Now this renders necessary, as a preliminary to psychological study, some course of scientific training. Certainly, as Mr. Stewart urges, the student should not be left to learn from the statement of psychologists what Science is (or is not). But I would add, neither should the student be allowed to take up Philosophy or Psychology without something more than what Mr. Stewart seems to think may serve instead of scientific training—some "ordinary experience of the kind of evidence required by practical men of culture for alleged facts and events". That means, I suppose, either that the study should be deferred till men have been about in the world, or that an acquaintance with good literature will afford the necessary experience. The one supposition amounts to an exclusion of philosophical study from the academic course altogether; the other is based on what seems to me the mistaken conception of Philosophy that pervades Mr. Stewart's paper. The truest friend of philosophical study, at the present day, will, I think, be the most anxious to contend for a preliminary basis of properly scientific culture. If Philosophy may be understood as rational interpretation of the universe in relation to man, it is of the utmost importance that philosophic thinking should work upon that knowledge which is surest—and this is Science. To say this is not to exclude Literature and History from the philosopher's preparation. The true nature of man is not to be learnt apart from the record of human actions in History and the expression of human sentiments and opinions in Literature. But the key to the philosophic interpretation even of Literature and History (their *enjoyment* is another matter) is to be found in the scientific habit of mind, and this can be gained only by a study of the special or positive sciences. While, therefore,

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[1] The really serious charge, not overlooked by Mr. Stewart, that may be urged against Psychology as it now stands, touches the vagueness and generality of its statements. Even in the most scientific of modern psychological treatises there appears little disposition (as the Scotch say) "to condescend upon particulars," and it does not very plainly appear in the books what advantage is gained by restricting the search to phenomenal explanation after the approved manner of the positive sciences, instead of having recourse to metaphysical entities like the "faculties" of the older theorists. No doubt, the business of a scientific manual or theoretic treatise is not to deal with special cases, but to embody general results and to enunciate abstract laws. The true sign, however, that laws proper have been established in any subject, is when they lend themselves to the explanation of particular phenomena, and inevitably suggest deductive applications to be verified by actual experience. The true sign that a science has reached (in its measure) the positive stage, is when its cultivators are moved to essay all kinds of special investigations, and recognise clearly the practical bearing of its principles. In proportion as this journal is made the vehicle of publication for researches into the special phases of mental life, will it prove the scientific character of Psychology, and so fulfil the prime object of its institution. Or, again, in proportion as English psychologists trust themselves to give direction to the educators of youth, will it appear whether those "Laws of Association" which they have put forward as determining all natural development of consciousness and more particularly all intellectual synthesis, are truly the ultimate scientific principles they suppose.

I contend for beginning a philosophical course with Psychology in the interest of definiteness and with a view to unanimity, I assume that Psychology—so special or complex if it is viewed (in its place after Biology) as an objective science, so unique and hard to grasp if it is viewed as the science of subjective experience—will not itself be the first scientific doctrine to which the student is introduced. If it be, the very advantage sought for in making it the first stage of a philosophical discipline is rendered impossible. If, on the other hand, it is itself regarded as the natural term of a general scientific training, the dire effects fancied by Mr. Stewart are in no way to be feared, even though it were true that psychological results could be made no more definite than he finds them.

The case for Psychology is in truth extremely plain and simple. In Philosophy we are going to consider what may be said more or less determinately concerning the whole frame of things and man's relation thereto; and we can proceed in either of two ways. We may begin in haphazard fashion, looking at the universe of being from this particular side or that, according to the fancy and temperament of the thinker. Or we may be guided by the thought that well-ascertained knowledge, to which we give the name of Science, has become possible under certain conditions of purely phenomenal consideration, and, as it is clear that our mental life in its various phases must contain an expression for all that is known, felt, or aimed at in relation to the world of being, we may seek to come at our ultimate comprehension of this through the most strictly scientific consideration that may be attainable of the facts and laws of mind as it appears. This psychological science is not in itself Philosophy, but there is no philosophical question whatever that has not its roots in some fact or facts of mental experience, and, however difficult it may be, men can, if they try, come to something like agreement here, and may then be impelled towards the same philosophical conclusions beyond. This is the great and fruitful idea that has inspired all characteristically British thinking for more than two centuries past, and it has been a truly philosophical conception even in those cases where the thinker has sought to merge everything in mere Psychology, and failed to mark where he crossed the border-line. It has preserved English philosophers from many a pitfall that has received less wary thinkers, and, as it arose in Locke and others from their having regard to the first great achievements of modern science, so in these latter days, when the natural sciences have had, as it were, a new birth, it has gained widely upon men's minds, and become the dominant conception in Philosophy.

If Psychology (with due preparation) is taken first in a philosophical course, Logic will naturally follow next. Should the formal doctrine, as Mr. Stewart suggests, have entered into the school-work, so much will have been gained, but, if not communicated earlier, it can no longer be deferred. The importance of Logic as a preliminary to philosophical thinking is accurately described by Mr. Stewart; or it may be regarded as a constituent part of Philosophy. There is not a more intelligible, or, when fairly understood, a more satisfactory definition of Logic than to view it as the doctrine *regulative* of thinking (or general knowledge) with a view to truth. From this point of view, its relation to Psychology and also its distinctive character are at once clearly seen. For the regulation of thinking it is necessary to understand how thinking naturally proceeds; at the same time, psychological insight does not of itself supply regulation. Regulation is a practical requirement, not a simply theoretic or scientific conception, and as applied to a phase of mental life corresponds with the strict notion of Philosophy. Logic, in relation to Psychology, may therefore be regarded as a department of Philosophy, and this entirely without prejudice to another view according to which it may be taken as the most general of the abstract sciences, more general (in the sense that it deals with wider and simpler *objective* relations) than Mathematics, as Mathematics is more general than Physics. The conditions of Truth or true knowledge —Science as opposed to Opinion—being the concern of Logic viewed as a philosophical discipline, the discipline must be not less wide than are the varieties of truth. There is truth, as we say, to one's self and truth of fact, or (otherwise expressed) truth of consistency and real or objective truth.

Formal Logic determines the condition of self-consistency, and is very properly taken first, because the prime concern with all of us, born as we are into the social state, is to work out more or less fully the meaning of the general assertions communicated to us that make far the greatest part of all we call our knowledge, and to apply general rules of practical conduct which it was never left to each of us to devise. But it is quite necessary to follow up Formal Logic with that other doctrine of Applied or Material Logic (or however else it is called) to which Mr. Stewart so pointedly refers. The study of such books as Mill's *Logic*, or Prof. Jevons's *Principles of Science*, in their methodological parts, may have little meaning for minds that know nothing of the special sciences; but students who have even a small acquaintance with scientific facts are very profitably led to consider the principles of evidence upon which they are received with a confidence varying in different kinds of matter, since the very same principles are involved in all the *real* inferences drawn in common life. At the same time it may be readily granted that to catch the true scientific spirit it is necessary to follow a master like Mr. Darwin at his work, be it coral-reefs or carnivorous plants that he is for the time investigating with an almost unconscious perfection of method; though the real appreciation of what in him has become art is greatly helped by foregone express study of Methodology. The class of inquiries coming under the head of Theory of Knowledge, it should also be added, falls to be introduced at this stage. The most scientific part of Philosophy proper is naturally associated with the logical determination of the conditions of Science.

On the same level with Logic and in a similar relation to Psychology stands Ethics. The student is not fit to enter upon this department of philosophical discipline without such preliminary training as has here been sketched, but with such training I do not see in what respect—as, for example, want of as much knowledge of the world as he may afterwards acquire—he is now unfit to be introduced to it. Now or at any time, however, he ought, in my opinion, to be introduced to ethical questions, not upon any interest he may happen to feel or be induced to feel in a particular work, whether of Aristotle or another, but definitely in relation to the original start in Psychology. Human action needs to be regulated as well as simply accounted for, and the philosophical theory of its regulation is Ethics, but for this it first needs to be explained in its natural manifestations. In a complete philosophical course, the student would also have presented to him the theory of the regulation of Feeling as far as this has yet been worked out, on a psychological basis, in Æsthetics.

What remains, as it seems to me, is that at this stage and not before—at all events not before Psychology has been followed up by Logic in its broader interpretation—the study of History of Philosophy should be seriously taken in hand. And I do not hesitate to say, with all the fear of Mr. Stewart upon me, that the study should in the first instance be made quite comprehensive and general, and that only afterwards should come that special occupation with this thinker or the other which with Mr. Stewart is the beginning and end of philosophical discipline. I would add too—what has been already remarked in another connexion—that when it comes to this it is no matter of indifference who the thinker is that should thus be assimilated into the student's mind. As we have to think now-a-days in reference to a quite different experience from that of two or three, not to say twenty or more, centuries ago, it behoves the student to begin his *special* study of philosophers with a master not too far removed. The English student, supposing him to have become moderately familiar with the recent work of his own countrymen at the earlier or more positive stages of his philosophical course, cannot procure himself at once so much elevation of view and so much serious discipline in regard to the intellectual needs of the present time as by a thorough study of Kant at first hand. What knowledge of previous speculation is necessary for the understanding of Kant will have been obtained in the course of that general view of the development of philosophical thinking which is here supposed to have gone before.

The reason for studying Philosophy proper in its History is not far to seek. Even Science cannot be intelligently laid hold of without some notion of the way along which the present state of knowledge has been reached. Much more will it be an aid to philosophical insight to mark the past phases of speculation. Though there is no greater error than to suppose that there has been no movement in philosophical thinking or that there has been movement but no progress, it is not to be thought that a serious philosophical doctrine that fully satisfied the human mind at any stage of its development, can be discounted like the first rude representation of fact in early Science, or that it retains a purely antiquarian interest only. As Philosophy, though also a representation of a certain kind of fact, is essentially a representation that keeps terms with human feeling and human aspiration—is, in point of fact, *subjectively* determined—we are to expect in this department of human conceiving a certain recurrence of typical modes of interpretation that can never lose their value for different classes of minds, and thus an amount of guidance from the historical past which is not to be expected elsewhere. Nor, for my part, do I see how Philosophy proper (or Metaphysic in its stricter sense) can profitably be conveyed to students except in the critico-historical fashion. Even if a teacher, in these critical rather than constructive days, seeks to expound *his* ultimate view of things to a class of students, it is to them but one other added to the tale of historical systems, and the chances, in any particular case, are against the supposition of its being of equal value with the greater philosophical constructions that have weathered the storms of time. As the crown of a philosophical education, students are to be taught to think for themselves; and to this end there seems no other way but that of bringing before them a representation of the thinking of the best minds of the race. On this vital point there is no difference between Mr. Stewart and me. I object only to the arbitrary way in which he seems to shut up the student to converse with this single thinker or that, whereas I would give the student, after due preparation, the free choice of all. And as a last word I repeat *after due preparation*—scientific and other.

THE ACTION OF SO-CALLED MOTIVES.[1]

MR. SETH in his *Development from Kant to Hegel* (reviewed in *Mind*, No. 27), after remarking against Kant's theory of 'intelligible freedom' that "in separating the *man* from his 'character'—intelligible or phenomenal—an unwarrantable abstraction is involved," goes on (p. 105 n.) to say:—

"Kant seems to be in quest of the phantasmal freedom which is supposed to consist in the absence of determination by motives. The error of the Determinists from which this idea is the recoil, involves an equal abstraction of the man from his thoughts, and interprets the relation between the two as an instance of the mechanical causality which exists between two things in nature. The point to be grasped in the controversy is that a man and his motives are one, and that, consequently, he is in every instance self-determined."

A somewhat similar view as regards (at least the language of) Determinism was expressed by me, some nine or ten years ago, in a short unpublished paper read (as a text for discussion) before the now defunct Metaphysical Society; and as the position there taken up seems to me still worth insisting on, whether as regards the special question or in the more general reference opened out at the close, I will venture to submit to the readers of *Mind* the paper in its original form (though if I were writing now I would alter some expressions).[2] It ran as follows:—

"When a man wills, it is common to say that he acts under some motive or motives. The expression, like other popular sayings about mind, has an objective or materialistic implication. As one ball may be motive, or the motor, of another, so a man is supposed to be put in motion, or determined to act, by something other than himself. Not that even in the common apprehension a distinction is not made between the moving of a man and the moving of a ball: a man is often seen to act, as it is said, of himself or of his own motion; when there is a motive supplied from without, this need not be a thing thought of as in any way moved; and any such motive is plainly seen to have its effect conditioned by the nature of a man in a fashion to which the inertia of a ball furnishes only the faintest analogy. But yet the general analogy is understood to hold, and very many cases of human volition admit of being described according to it well enough for all practical purposes. It provides a kind of reason for the uniformity and constancy which men find, and are most interested to find, in the acts of their fellows. The variety and inconstancy also found, people deal with in practice as they best can, and do not pretend to explain.

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[1] *Mind*, vii. 567.

[2] In one or two sentences of the last paragraph but one, the thought resembles that to which Mr. Spencer had already given expression in the *Principles of Psychology* (i. § 219), published a year or two before, but I was not aware of this at the time.

"The expression, however, has further been drawn into the scientific or philosophic theory of will, being assumed alike by the determinist and the indeterminist for their opposite readings of the psychological process of volition. These theorists have in dispute between them what seems a strictly philosophical issue, and the only one involved in the secular question as to free-will. The determinist, or, to use Priestley's word, the necessarian, declares that volition is always wholly determined by motives,—that in some motive or motives the sufficient reason, or efficient cause, of every voluntary act is contained. On the other hand, the indeterminist contends that there is also the ego or will itself to be reckoned with; the ego may pass into action without motive, and with motives present is always called, if proceeding rationally, to decide which among the motives should be yielded to. The consciousness of such a power of self-determination, either absolute or with reference to some particular motive which thus acquires an efficacy not its own, is the point perhaps most strongly urged by the indeterminist. It is replied by the other that the rational choice or supposed self-determination is only the coming into play of some other motive.

"Looking at the two theories from without, I cannot but think that the determinist, with his causation by motives, fails to take due account of the subject that is determined. Call motive to a particular action some present or represented feeling which the action will in the one case sustain or in the other bring on, and, in yielding to the motive or in its determining to the act, what is that which yields or is determined? Whether named subject, mind, ego, or will, it must be supposed something with a nature of its own, through which it will co-operate with the motive towards the resulting act; and this doubtless is what the indeterminist has in view, when he urges his counter-theory. But is the counter-theory, as it is expressed, less open to criticism? Hardly; for the terms employed to express the relation between the feeling and the act are in truth equally applicable to that which comes of the co-operation of the mind or ego. If the feeling is in any strict sense a motive to the act, the so-called rational determination, through which, let us suppose, the feeling is overcome and the particular act is deliberately repressed, can perfectly well be ascribed to the intervention of other motives. The determination, being rational, has its grounds; nor would it be without motive, even though it sprang from mere caprice. This a clear-headed thinker like Hamilton, himself no necessarian, is not only constrained to allow, but forward to assert against such an advocate for free-will, not clear-headed, as Reid, and accordingly he finds the moral liberty of the indeterminist wholly inconceivable. It is true that nevertheless he is able for himself to accept it as a fact upon the direct testimony of consciousness.

"From the presence of such difficulty in each of the theories it would be wrong to infer that their antagonism is more apparent than real—more real and profound it could not be; but we may suspect that for one or for the other the difficulty arises from a defect in the language employed by both, and with a different statement would vanish. Such defect appears to lie in the word 'motive,' which may have a serviceable application in the popular view of man and the world, but has no scientific, which is to say here psychological, value whatever. In the common apprehension, a man is an object among objects, acted upon by and reacting upon them, and only irregularly or vaguely is any account taken of the subjective conditions under which the reaction, when voluntary, takes place. Language, as begotten of common needs, follows suit, and consistently enough, at least for practice, speaks of a man as acting under motives, or of motives as influencing a man. Very naturally, then, when there is a beginning made of psychology, and mental states as such have to be considered, is the popular expression diverted from its original and proper reference to man as a physical object, and employed with a reference to mind, or still more specially to will, as if the mental states had a separate subsistence therefrom. But however natural, surely this is a most improper transference. In no strict sense can the feeling to sustain or bring on which an act is performed, be called a motive to that act as a psychological state. The feeling and the willing of the act are two successive moments in consciousness, and that seems the whole psychological statement of the case. Or, to be more particular, if the act is willed directly upon the feeling (present or represented) being had, that can only mean that a representation of action associated with the feeling becomes actualised, or passes into action present. If, on the other hand, it happens that, in spite of the feeling, the act is not willed, but either it is willed that the act be not done, or something else is willed, or there arises a state of mental suspense,—that can only mean that some other feelings and ideas have supervened in consciousness, and have acted themselves out or not, as the case may be. But from this point of view there is no more any question of an ego to be reckoned with for explanation of the volition. No doubt reference to a mind, ego or will, apart from the particular conscious states, is still possible, and not only possible, but under the conditions of language inevitable, for conscious state must be held to imply something of which it is the state, as much as motive implies something that is moved. Here, however, the reference is one of mere expression, which leaves the psychological explanation unaffected. While the correlate of a motive is truly a distinct thing objectively, to be separately allowed for, it is quite otherwise with the ego or mind, and *a fortiori* the will, spoken of as the subject of particular conscious states. A feeling which is a state of the ego, is the ego in a certain state, and not less the ego because the state at the particular moment might conceivably have been a different one, and does, in fact, the next moment give place to one that is different. Or, if a conscious state is not that, what is it? Now, with no ego left that can modify the succession of states as they emerge, to discover the psychological law of the succession is to give all the explanation that is possible of volition. The matter would then stand thus: If so-called motives are not understood as definite mental states, they are of no account for the psychological explanation of will, and any theory of their action, deterministic or indeterministic, is unphilosophical. If they are so understood, they should in psychology be so expressed, and the theory of indeterminism, or more properly the doctrine of free-will, becomes untenable. It is tenable only if an ego can be found which is not an ego already determinate; but such an ego, though it may be logically distinguished and verbally expressed, is not a real factor in psychology.

"The argument has this moral: that, if mental philosophy must use a language devised for purposes other than philosophical, it cannot be too careful about the inferences it founds upon the words. Even the objective sciences, as they advance, drift farther and farther away from the use of popular expressions, and beget a technical language of their own. Psychology only, though as subjective science it can least of all be served by common speech, developed as that has been with an almost exclusively objective regard, tries to work without such technical aid. This is not surprising, because, if it were sought to devise an appropriate and perfectly consistent language for the results of psychological analysis, it would differ so profoundly from common speech as to be unintelligible, even in its principle, to all but adepts; whereas in other sciences, however abstract, at least the principle is perfectly intelligible to people in general, and in most of them the difference is only one of greater constancy and precision in the use of the verbal or written signs employed. But the consequence is that, while popular conceptions and misconceptions do not gain a footing in the objective sciences or can be easily extruded if they do, mental philosophy has always been more or less tinctured by an admixture of popular opinion, not rendered more philosophic by being refined upon. There have been writers of no small repute who never could place themselves at the philosophical point of view, and there are no thinkers who, when it comes to expression, do not find it difficult or even impossible to maintain consistently the philosophical attitude. With language what it is, this must always remain so; but the greater is the need to signalise the difficulty and the danger."

PSYCHOLOGY AND PHILOSOPHY.[1]

I DESIRE to offer, in the following pages, some remarks on a question that has found definite expression from the time of Kant, if not earlier, and that claimed attention before now in a journal calling itself a Review of Psychology and Philosophy. Though not wholly passed by in the few words of general preface with which *Mind* was started seven years ago, the question how Psychology and Philosophy are related to one another, so as to be coupled at all and coupled in this particular order, deserves at this time a more careful consideration. But, after an editorial experience of so many years, a preliminary word or two of retrospect over the course that is past will not be thought irrelevant to the present discussion. How far does experience seem to have justified the idea of founding a philosophical journal in England and making it in the first place psychological?

I will not conceal my own feeling of disappointment that there has not been more of positive contribution to psychological science in its pages. If they have faithfully reflected the amount of psychological activity in the country, it cannot be said that this has been appreciably increased in the last seven years, because of the opportunity here afforded to any psychologist of bringing the results of his inquiry under the notice of other students. The Journal has not yet succeeded in fostering—if it might have been expected to foster—such habits of specialised investigation in psychology as are characteristic of the workers in other departments of science. There is little sign in our midst of the disposition (or, perhaps, the ability) to work on such special lines of psychological research as other countries give evidence of.[2] Investigations like those which are being systematically pursued at Leipsic and elsewhere in Germany are not yet undertaken in any of our universities or colleges; and monographs on particular phases of mental life have been notably more frequent of late in France (as well as in Germany) than in this country.[1] The reason is, perhaps, not far to seek. Our academic posts are few altogether, and have in general such multifarious duties attached to them as do not favour the concentration required for this kind of work. But the disposition is, after all, the main thing, and here it is to be noted that in so far as it is still the influence of what is called the "English Psychology" that maintains the interest there is amongst us in the positive investigation of mind, this does not tell in the way of stimulating to special inquiry. For all the name it has made in the world, English psychology has never been remarkable for its elaboration in detail. Some few special questions it has been led by historic circumstances, if not by accident, to investigate in a more thorough way; but in the main its reputation has been founded on the enunciation of general principles which, while directly psychological in their import, have been thought of rather for the philosophical application to which they appeared to lend themselves. Treatises on Man or Human Nature, Essays or Inquiries on Understanding generally, Analyses of Mind in all its aspects—these have formed the staple of English productions in this field. So, at the present time, it is rather the reconsideration of the psychological point of view, whether in reference to philosophy or in reference to the range of mental inquiry as newly enlarged by the biological principle of evolution; or it is the revision of the whole psychological field with a view to including and ordering the great mass of new facts that have been brought to light, chiefly from the physiological side; or, again, it is the application (too long delayed) of psychological principles to the practical work of education—it is these various tasks that are now engaging the attention of those who set store by the tradition of "English Psychology". But there is other work to be done also, and we shall soon fall too far behind in the scientific race if we have not our own record of positive results to show.

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[1] *Mind*, viii. 1.

[2] Exception should be made for Mr. F. Galton's researches on Generic Images and on Automatic Representation, noticed in *Mind*, iv. 551, the former of the two being followed up by him in *Mind*, v. 301.

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[1] Mr. Gurney's elaborate *Power of Sound* is one instance of the kind of special treatise here meant; Mr. Sully's *Illusions* is another.

Otherwise, it may perhaps be claimed that the past volumes of *Mind* have not succeeded one another to no purpose. They have kept English readers, for the last seven years, better informed than they would else have been of the psychological and philosophical movements in other countries, and they have given a representation that cannot be called other than impartial of the manifold currents of thought running among the English-speaking race here and in America. If at times some forms of opinion have seemed to assert themselves more than others, the fault lay with the others that chose to assert themselves less. It became clear from the beginning that the number of English thinkers, at the present day, who cared to have a clearly defined psychological basis was very small: not that any can be without their psychology, but that most are of opinion either that it supplies no basis for philosophical consideration or that they can get on very well without thought of it. All who had anything serious to say have, therefore, from the first been encouraged to deliver themselves of their message, whatever it might be; and while I reflect with satisfaction that the chief opponent, in this generation, of the English philosophical tradition was using the Journal for the exposition of his matured conclusions when a cruel fate snapt on a sudden the thread of his life, I can truly say that no philosophical contribution offered has ever been declined on the ground of its being of one cast of thought rather than of another. As this has been the rule in the past, so is there a fixed determination that it shall be in the future. Nor does comprehensiveness of this kind mean philosophical indifference—the absence of all conviction in one who seeks to practise it. It may, perhaps, be taken rather as a sign of understanding that in philosophy there is room for differences of view, which need clearing in relation to one another while they remain differences. There is urgent need, in the present state of philosophical speculation, for that free and direct interchange of thought from opposite sides which *Mind* has done something to promote and may yet do more. Mutual understanding—not agreement—is the object to be first striven for. It is with some thought of helping in that direction that the following pages are now written.

When Psychology is distinguished from Philosophy and the question is raised whether there is any special relation of the one to the other, it is Empirical Psychology that is to be understood—the science of mind worked out in the way of the natural sciences, if not regarded as itself one of them: Rational Psychology has always been taken as philosophical or nothing. Now of empirical psychology Kant, in a well-known passage near the close of the *Kritik d. r. V.* ('Architectonic of Pure Reason'), has declared that it is nothing to philosophy proper or metaphysic, any more than the empirical study of nature is; or that if it may continue to get a little attention from the philosopher, this is only upon sufferance, and until it is taken vigorously in hand by the specialist and turned into Anthropology, as a complete scientific doctrine of man.

It is a remarkable saying of Kant's, and not least remarkable is the prospect held out of a wider science of man within which any scientific psychology must fall. The declaration as to Anthropology proves—more than his own treatise on this subject, full of genuine observation as it is—how thoroughly he understood what work had to be done in the way of science for a comprehension of human nature: no mere collecting and sifting of objective facts, but also work of psychological (subjective) analysis conducted according to the methods of positive scientific inquiry. Nor, in denying philosophical import to psychology, was Kant in the least unaware of the special claims that might be set up for the science in this respect. He begins the passage by a reference to the expectations which in that very age had been formed, that psychology might be able to achieve for metaphysical insight what the method of *a priori* speculation was being abandoned for having failed to effect. Kant, we know, had himself for a time shared the opinion, borrowed from German psychologists of that day, like Tetens and others, more perhaps than from Hume and Locke, that a scientific doctrine of mind must be placed first in any philosophical discipline. But also from Locke and to some extent from Hume (at least Hume of the *Inquiry*) he had had occasion to learn what they had to urge to the same effect; and if, in the end, he declares roundly that metaphysic has nothing to do with psychology, it is done with his eyes hardly less open than if he had had before him all that later psychologists of whatever different schools—British or Continental—have since sought to demonstrate to the contrary. At the same time, it is of interest as well as to the point to remember that Kant himself lies under the imputation of remaining too much influenced by the idea with which he was once infected that psychology is the foundation of all genuine philosophy. If some regret that he ever outgrew the idea and did not spend himself in giving it effect, others find in the rags and tatters of psychological doctrine which he could never throw off, the explanation of all his shortcomings as a philosopher.

It is certainly to Locke that we must go back to find the beginnings of the opinion that philosophy should start from what is now called (though Locke did not call it) psychological inquiry. There is in Hobbes, in the previous generation, more express inquiry of the psychological sort, but not pursued with any such directly philosophical purpose. Locke, with the definite aim of furnishing a theory of the validity and limits of knowledge, elects to proceed by what he calls the "plain historical way" of a consideration of its origin; in other words, he seeks to solve the philosophical question of the import of knowledge by reference to the psychological question of its coming-to-pass. The idea worked so powerfully that, in the next generation, we find Berkeley solving the religious question of the relation of the creature to the Creator through a philosophical theory of knowing and being suggested by a special inquiry in the psychology of vision; and Hume, in turn, declaring that, while even such sciences as mathematics are in a manner dependent on the science of man, this is still more true of properly "philosophical researches," which can be conducted only after a scientific understanding of human nature, to be attained by the same way of "experience and observation" as had been found effective in other sciences. When Hume thus wrote, Locke's idea of psychological inquiry had been caught up in a still more positive spirit by Hartley, and through Hartley more than Hume it has worked upon those who in this century have advanced farther upon the way of thinking that has become stamped as characteristically English. Even the reaction against Hume's philosophical conclusions, in Scotland, started from a not less emphatic assertion of the need of resting philosophy upon an inductive science of mind; and meanwhile, by the middle of last century, Locke's idea was being ardently worked out also in France, Germany and Italy. It was thrown into the shade by the Kantian conception of Critical philosophy and remained in abeyance during the whole period of eager speculation that followed; but all the while, in Germany, psychology was making way as positive science by the labours of Herbart and his school, and in time it came again, first through Beneke (under the direct influence of Locke) and afterwards in connexion with the forward movement of physiological science giving a new definiteness to psychological results, to be regarded as of special significance for philosophy.

What is, then, the exact import of the idea thus introduced by Locke into the stream of philosophical thought? It is (so far as philosophy turns upon the problems of knowledge) that, before attempting to determine what can be known ultimately of things, investigation shall be made of the human faculty of knowing by the same method that has been found effective in the region of the positive sciences. Locke was deeply impressed by the scientific achievements of his century, culminating in the work of Newton, and, while declaring that for himself philosophy is turned from direct speculation about things into general theory of knowledge as complementary to the special sciences, he is most of all decided on the point that such philosophical theory can be wrought out only after scientific account has been rendered of mind. This is his really characteristic idea; for the conception of philosophy as theory of knowledge in relation to the sciences is equally proclaimed by Kant later and had already been shadowed out earlier by Descartes. To arrive at philosophical conclusions that might the more readily command assent because drawn from a basis of properly scientific results about mind, which could no more be contested than any results of mathematical or physical science—such is the idea of Locke and his followers. It gets the pointed expression before quoted from Hume, and it has determined the form of all homespun English thought ever since. It is not that in putting psychological considerations in the front the English thinkers have eschewed the work of philosophy; for they have never hesitated to pronounce on ultimate questions, it being rather their conception of the range and limits of psychology that has remained uncertain. But there has been a common persuasion among them that there is need of a definite scientific platform from which to start upon the search for philosophical comprehension, if anything that can be called knowledge—more than subjective opinion—is to come of the quest. So far, again, as philosophy is to provide guidance as well as insight—has in view not only rational interpretation but conduct and aspiration—here also the thought has been that beginning should be made with scientific investigation of the processes of feeling or impulse natural to man.

The idea, however, is one thing, and another thing is the carrying of it out. It may be possible, as we shall see, to maintain in the present scientific era the advantage or even necessity of basing philosophical consideration upon psychological inquiry, and yet it may be allowed that the idea, as originally struck out at another time of strenuous advance in science, has never hitherto been circumspectly enough put in practice. Locke and his followers to the present day have proceeded in a manner that has laid them open to a kind of criticism that apparently makes an end of their pretensions to rank as a serious philosophical school. The criticism directed by Green against Locke and Hume tells also, as it was plainly meant to tell, against Mill and others in this generation who, working at philosophy from the standing-ground of psychology and making whatever progress in either department, have been hardly more careful than Hume or Locke to draw a clear line between natural science of mind (or man) and the ulterior consideration of things in relation to mind. The point of the criticism urged by Green (after Kant), with a massive persistence that stamps it as an original philosophical achievement, is too well known—repeated as the argument has lately been in these pages—to need more than general indication.

Locke and the others are charged with assuming for the explanation of mental experience that which is itself unintelligible except as the result of a mental function. They would account for mental experience, including thought, by supposing a world of 'objects' acting upon a mind or a multitude of minds, when it can be shown that the very things or objects assumed are themselves mental constructions dependent on the activity of that thought which is in this way to be explained. The moral is that in no such way as the English school has trodden can the work of philosophy be performed, but only by a path at least as different as that which Kant had in view, when he scouted the notion that the least philosophical importance could be attached to psychological (or anthropological) science.

So far as it bears against Locke in particular, the criticism, it must be allowed, is not to be repelled,—if it were anybody's business at this time of day to defend the language or the thought of his *Essay*, so wavering and uncertain as both plainly are. Indeed, it is one view to take of the work of his immediate successors, Berkeley and Hume, that they did something to obviate, by anticipation, the objections that can be urged with incontrovertible force against his shifting positions. But neither did Berkeley and Hume define their ground with sufficient care, nor proceed far enough in the way of systematic construction, to evade the criticism as it was to be levelled also against them. Berkeley with his religious and Hume with his dialectical aim had neither of them in view, to the same extent as Locke himself, a positive solution of the philosophical problem of knowledge in keeping with the facts of psychological science. If no more could be said for the new method in philosophy than they were at pains to urge, there was need enough for Kant's newer way. As for the later English thinkers, if they continued to maintain the psychological starting-point, they were bound at least to bring their doctrine face to face with Kant's theory of knowledge *in detail*, since never before, from any point of view, had the work of philosophical analysis been carried so far. Their failure to do this has, more than anything else, weakened the impression that might otherwise have been wrought by the signal advances they have made or rendered possible in constructive interpretation beyond their pre-Kantian compatriots. And thus the hostile criticism directed against these has seemed by no means wanting in point against themselves. Can it in any way be met?

Those who would still in these days cling to the English tradition or rather uphold the idea of it all the more in the changed conditions of the time—changed alike by the widened scientific inquiry and by the deepened philosophical thought of the last hundred years—may (as it seems to me) materially strengthen their position by making more express distinction of Psychology and Philosophy than has been usual in this country. It is a mistake to think of psychology because it is concerned with mind, or natural science of man, because it deals with man, as meeting all the requirements of philosophy. Nor is the difficulty met by such a vague use of the word Metaphysics as satisfied Mill (as well as Hamilton and Mansel): the name is misleading when applied to psychology, and confusing when it is held to justify the conjoint treatment of epistemological or ontological with psychological questions. 'Philosophy of Mind' or 'Mental Philosophy' might seem to lend itself better to the double use, because it may stand for psychology like 'Natural Philosophy' (in the English usage, after Newton) for physics, while opening for the first time a vista of ulterior or deeper consideration in the word Philosophy; but nothing is gained by the attempt to combine under one designation what it is of the first importance, for clearness of view, to separate. Till psychology and philosophy are kept well apart, neither the one nor the other can have full justice done to it. Any advantage there may be in passing to the one through the other is certainly imperiled, if there is the least pretence made that the psychology is already philosophy. Let us, first, try to define the true character and position of Psychology, and if we find it to be science of altogether exceptional scope, bringing it into special relation with philosophy, let us next determine the meaning that may be attached to Philosophy in relation to psychology.

Psychology, by itself, is, in the first instance, positive phenomenal science—positive as to its method, phenomenal as to its subject-matter. Its method does not differ from that of other positive sciences, like biology or chemistry, except as the method of any science is modified by the peculiarity of its subject. As phenomenal science, it is occupied with a particular class of facts, taken just as they present themselves. Phenomenal facts are appearances (aspects) of things, or occurrences in things as they appear. What is the meaning of 'thing' or 'appearance' or 'aspect' —these are questions which the particular science dealing with any class of facts leaves wholly aside. In so proceeding, the sciences may all be said to begin quite arbitrarily, because the questions are real and remain open; but the method is justified by the results. It is notorious that all the positive sciences, from mathematics onwards, have become constituted and made way just as they have cut themselves loose from that kind of deeper inquiry. Psychology, too, is science only upon those terms. Not that, in placing it thus far on a level with the other sciences, we commit ourselves to the position that mind is merely such another aspect of things after life (the subject of biology), as life is after material constitution (the subject of chemistry), or material constitution is after motion (the subject of physics). It will presently be argued that there is something in Mind, as the subject-matter of psychology, unlike anything else, that suggests the need of some other kind of consideration; while the fact, evident from the first, that the events or states (or however they are called) which psychology investigates, are apprehended only in the peculiar attitude of introspection, makes already a profound difference. Still there is a definite sense in which we may speak of mental phenomena as of vital, structural or other phenomena; and in this sense we are entitled, nay bound, from the scientific point of view, to make all necessary assumptions, were it only to get language in which to state our results.

The psychologist seeks to assign the natural conditions under which mental experience, as we are each (subjectively) aware of it, arises or comes to pass. For this he as readily assumes 'objects' (in the sense of material things) as any other man of science, and with as little prejudice to the deeper question what an 'object' is or how it can be known. It is plain fact that, but for the presence of what we call external objects in relation with the bodily organism (another object, also in its way external), certain of the mental events which the psychologist has to study—those that are called by the general name of Sense—do not come to pass. There is no way of rendering a scientific account of these (that shall be more than a bare subjective description) except in terms of the physical circumstances plainly involved. The circumstances, when more closely examined, are found to consist of physiological processes in an organism, in relation with such physical processes as science discovers upon resolution of the 'objects' of our common or natural experience. Advanced so far as to substitute the exacter expression for the vague opinion of common life that our bodies are somehow implicated with other bodies in the production of conscious experience, the psychologist has then obtained a definite clue for the scientific resolution of the whole complex of mental experience which offers itself to introspective observation. Those facts of mental life (subjectively apprehended) are first to be dealt with where there is a clear evidence of physiological process that can be assigned, and afterwards those where the physical conditions are of a more hypothetical character but can yet be imagined in continuity with those that are more evident; the same order of treatment (from Sense, through Perception and Representative Imagination, to Thought), once it is thus suggested, being confirmed by reference to the historical development of the individual and the race. Nor are the results arrived at less purely psychological because of the regard had to physical conditions. It is not the mere fact of natural concomitance between physical event and mental event that is in this way to be established, though it is of scientific interest and importance to ascertain the particulars of such concomitance, as a subsidiary result of the inquiry. The psychologist's reference to physical conditions, so far as it can be carried through, is everywhere made for the elucidation of the facts of subjective consciousness. It is these that he aims at classifying with a view to explanation, and the explanation consists at last in the establishment of laws of mind—laws which are 'natural,' but still of subjective import. There is thus a perfectly legitimate 'natural science' of mind (or man), against which, so long as it gives itself out for nothing else, there lies no more objection than against any other positive science. It is a legitimate and also, from any point of view, a necessary task to determine the conditions under which and the manner in which our conscious experience (as introspectively observed) *naturally* proceeds. The circumstance that the peculiar attitude of introspection must be taken up before the facts to be accounted for are apprehended, complicates the inquiry with special difficulties but does not alter the methodological conditions under which it may, and (if it will be scientific) must, be pursued.

But if psychology is thus, in its way, natural science, it is more also, or rather it leads to more. Mind, however it may be taken as the name for a peculiar class of (subjective) phenomena in relation with other (objective) phenomena, has also a wider implication. The 'other phenomena'—meaning such 'objects' or objective appearances as physical science investigates out of all relation to the fact of their appearing—have, as the very name 'phenomenon' implies, their mental aspect. They may be viewed as themselves part of our mental experience: not that this can happen at the moment when they are being taken as the physical conditions of the subjective facts which as psychologists we are for the time investigating, but that they can in turn be considered as subjective facts to be investigated. The object (physically understood) which as acting upon the organism gives the only means of stating in scientific terms how we come, naturally, to have such a subjective experience as we call sensation, cannot fail, in the course of the inquiry, to appear as itself also matter for psychological consideration. To be regarded as the condition of our having, in certain circumstances, the particular kind of conscious experience called sense, it must come within conscious ken; that is to say, it admits of statement in terms of another kind of conscious experience called perception, which has equally to be treated by the psychologist. Or the case may be put otherwise, thus. The psychologist, in giving account of sensation as a rudimentary kind of subjective experience, has to face the question how sensations appear all, more or less, as objectively referred or projected in an extended order —some appearing so much as sensible qualities of external bodies that it is only by an express effort that they can be thought of as sensations, others appearing indeed as sensations but thought and spoken of as 'bodily' from being either localised definitely on the surface of the organism or vaguely referred to some internal part. This is the *psychological* (as opposed to the philosophical or metaphysical) question of Perception, admitting, when so stated, of a strictly scientific solution. But what a transformation does such an extension of the psychologist's view not work! Not a single physical object or fact, as given in common experience or investigated in natural science, or again as assumed for psychological science itself, but now presents itself as a problem to be solved in terms of properly psychological, which is to say, conscious experience. There is, obviously, no science like this Psychology, whose subject-matter, however at first distinguished from that of other sciences, is seen, as we advance, to include (in a manner) the subjects of them all; which begins with assumptions like the other sciences, but after a time turns round and investigates its own assumptions as no other science does or can. Mathematics, physics and all the rest do each their appointed work and have nothing to say to the conditions under which their own or the others' work is appointed. Psychology alone, in doing its work, finds itself occupied (in a manner of its own) with the very matter of the others. Number and space, motion, material constitution, with every other aspect of things that is or can be conceived to be the subject of direct positive investigation, are in all their varied modes at the same time facts of conscious experience—in all strictness, *mental* phenomena, of whose elements and composition account may be rendered from the psychological point of view. If such account may be given, how can Psychology be spoken of as if it were only one among the other sciences, touching the philosopher, who comprehends things universally, no more nearly than any other? Psychology is not philosophy, but with Mind for its subject its scope cannot be less wide than the scope of philosophy. That is not to be said of any other science.

It is no wonder, indeed, that psychologists have slipped into philosophical consideration as other men of science have not, or that those philosophers who set store by scientific psychology have not been too careful to distinguish and separate the one kind of consideration from the other. If philosophy is, on the theoretic side, the comprehension of things as known, and, on the practical side, the valuation of things as ends to be striven for, what more natural than that the scientific investigation of the various phases of our complex mental life—distinguished, so far as they can be distinguished, under such heads as knowing, feeling and willing—should be mixed up with or have mixed up with it the philosophic inquiry? The conjunction is much to be deprecated, when we see how it gives occasion for groundless objections against the method of psychology as science. It is equally to be deprecated, if it can be shown to impede the free exercise of philosophical thought. But the fact that psychology and philosophy so readily intertwine is surely an indication of some special affinity between them. Let us now take up the question of their relation from the side of Philosophy. We have seen psychology refuse, because of its subject, to be classed as merely one science among the others. How shall we understand Philosophy in relation to the sciences generally, and more especially in relation to that science of psychology whose scope widens out into an all-comprehensiveness vying with that of philosophy itself?

Locke, who first, in whatever inarticulate fashion, proclaimed the necessity of starting with psychology, had a clear notion of the function of Philosophy in general, which his followers have too much lost sight of, some in their efforts to improve his psychological ground-work, others in their predominant concern to work out special theories of ethics or of logic from psychological data. If we discount Hume's *Treatise of Human Nature* because of its equivocal import, there has not been since Locke's *Essay* any work of comparable range in general philosophy produced by an English thinker from the psychological point of view. Beyond psychology, English thinkers have occupied themselves mainly with Ethics, till Mill in his *Logic* essayed the special philosophical task of providing a theory of scientific proof;

or if the present day has witnessed more than one notable achievement in general philosophical construction, these have not been projected directly, if at all, upon Lockian lines. Locke's notion of philosophy is of a general Theory of Knowledge wrought out, with psychological data, as complementary to the positive sciences. While this or that science is concerned with a particular department of experience or aspect of things as we find them, it is the business of philosophy to investigate the possible range of experience, to distinguish between what can and what cannot be known, and in particular to determine the conditions and content of real knowledge—all upon foregone psychological inquiry of the positive sort. Now this is the view of philosophy (on its theoretic or speculative side) that will force itself most directly upon any one who, being interested in mind as a subject of science among other subjects of science, cannot help seeing that mind has also a deeper implication which no positive science can resolve.

Apart from any question of psychology, it is notorious that (speculative) philosophy has in modern times changed its character from a theory of Being into a theory of Knowing. This has been mainly due to the rise and development of the positive sciences, as appears not less clearly in Kant's than in Locke's statement of the philosophical problem. The sciences are there as so many bodies of coherent doctrine about this or that kind of fact. The more special of them presuppose and are advanced by help of the more general, but, as has been already remarked in another connexion, not one of them (always excepting psychology) has any light to throw upon the matter or assumptions of the others. They employ a language which none of them (unless, again, psychology) is in any way able to explain: 'object,' 'thing,' 'substance,' 'quality,' 'aspect,' 'phenomenon,' 'relation,' 'cause,' &c., &c.—how can any of the sciences proceed without the use of such words as these, but which of the sciënces has any account to give of them? Clearly, then, there is just as much need of a theory of the conditions of knowing anything as there is of a theory of this or that kind of thing. The theory of this or that kind of thing (as found) is what we call a science. The further indispensable theory of what the meaning of science or any kind of knowledge is, may or must be called Philosophy. So far all are agreed who will think of philosophy in relation to science; and not only (though more) in modern times, for, with a less definite conception of special science, Aristotle also had his view of 'First Philosophy' as general theory of knowledge. Consider now the science of psychology in particular. Psychology also, as dealing with a special kind of fact, needs to be supplemented (as science) by philosophical consideration. But psychological fact includes the very function of knowing, which is the subject of philosophy. A different statement of the relation of philosophy to psychology is, then, required than in the case of other science. There it was enough to say that philosophy has the task of analysing to the bottom the conceptions and assumptions which the sciences generally or any sciences in particular employ without being able to give account of them; being thus fundamental theory of science while science is theory of things as they appear. Here, where the particular science (psychology) and philosophy have both to do with the fact or function of knowing, the statement must be that they have a different kind of account to give of it. And there is room for such difference. When psychology has explained knowledge as a phase of conscious experience naturally conditioned, there remains for philosophy the question of its import or validity as knowledge.

The distinction may, first, be made plain by an example. As we have already had occasion to note, the psychologist is met at the earliest stage of his inquiry, when treating of sense, by the remarkable fact that sensations, which he must regard by themselves, analytically, as purely subjective states of feeling (arising in physical and physiological circumstances that can be assigned), do yet appear in actual experience with varying characters—some vaguely and others definitely referred to parts of the physical organism, while still others are projected so as to appear naturally as qualities of external things. We need not pause now to state the case in all its variety more exactly: it is met by the psychological distinction of perception (sense-perception) from sensation, perception being a cognitive or intellectual process resulting in what are best called percepts. A percept is a particular fact of intellectual experience, as singled out for investigation—when it can be proved to be essentially complex, however apparently simple. Now in any such percept, as, for example, a definitely limited portion of space, or a particular object in space with a variety of sensible qualities, the psychologist's interest ends when he has shown what elements (not further analysable) of sense it involves and under what laws these come to be so ordered or fused as they appear in natural experience. The psychologist's interest ends and just then the philosopher's interest begins. Both agree in regarding the portion of space or sensible object as percept, that is to say, as fact of conscious experience, not (as in physical investigation or common life) as fact or thing out of relation to mind. But while the psychologist has in view the percept only as it is *perceived* and explains how the perceiving comes to pass (in me or in you), the philosopher asks what the perceiving imports (for you and me equally)—in particular whether it means or need mean, as it is commonly taken to mean, a thing independent of the perception of either of us. What is the space or object that we perceive? What more is there in it as perceived, than as fancied? If said to be real or objectively valid (as a subjective fancy is not), what makes it so? These and the like questions, which it is not for the psychologist to answer (though it were allowed that he can best put them in train for answer), touch the very heart of what we mean by Knowledge. We may view knowledge as mere subjective function, but it has its full meaning only as it is taken to represent what we may call objective fact, or is such as is named (in different circumstances) real, valid, true. As mere subjective function, which it is to the psychologist, it is best spoken of by an unambiguous name, and for this there seems none better than Intellection. We may then say that psychology is occupied with the natural function of *Intellection*, seeking to discover its laws and distinguishing its various modes (perception, representative imagination, conception, &c.) according to the various circumstances in which the laws are found at work. Philosophy, on the other hand, is theory of *Knowledge* (as that which is known).

But, if we thus take philosophy as Theory of Knowledge, beyond psychology, it needs to be defined on other sides also: in relation to Logic, accepted as this has been for philosophical doctrine by none more expressly than by Mill and others among the later representatives of the psychological school; and, again, in relation to Metaphysic, the most widely accepted synonym for anything that can be called Philosophy. What we may leave aside, on the present occasion, is the question what other definite lines of philosophical thought are opened up for the psychologist by the other phases of mental life which he distinguishes, from Intellection, as Feeling and Will. It, of course, follows that there are such other lines, when it is seen how the psychology of Intellection passes into philosophical Theory of Knowledge; but the present object is not to lay out the whole philosophical field—only to indicate a point of view.

There is special need of distinction between Logic and Theory of Knowledge; for some (as Hegel) would use the very name Logic for philosophy when conceived as Theory of Knowledge, and others (as Mill), while retaining the traditional conception of Logic, though widening it in a certain admissible way, are found importing into the exposition (as in Mill's chapter iii., "Of Things denoted by Names") a series of considerations which are plainly extra-logical and can only be called epistemological. And, from any point of view, is not Logic a philosophical theory of knowledge? What is valid knowledge? When is knowledge valid so as to command universal assent? What is known truly and what not truly? These questions, which we have used to express the problem of philosophy as opposed to psychology, seem to apply equally to the problem of Logic. Logic is undoubtedly concerned with validity of knowledge. But knowledge to the logician is what is more particularly called Thought; some saying this expressly, others meaning Thought generally when they adopt the more special name of Reasoning, and others implying the same thing when they speak of logic as having to do with validity of Inference (formal and material) or the conditions of general Proof. Now if we substitute the word Thought, which properly means *general* intellection or intellection *by way of concepts*, for the word Knowledge in the questions just repeated, to make them more accurately express the subject-matter of Logic, we get at once a clue to its distinctive feature as compared with Theory of Knowledge.

Logic, while equally with Theory of Knowledge to be distinguished from psychology as occupied with the philosophical question of validity, is to be distinguished from Theory of Knowledge in having to do with the validity of Thought only as it is general. This view of Logic, as having for its subject the import of the *generality* of general knowledge, agrees either with the limited conception of the doctrine as Pure or Formal Logic or with its range as widened to include Applied or Material Logic. Even when applied to this or that particular kind of matter, Logic goes no further than to determine the conditions of valid *general* statement (as deductively or inductively obtained) in the particular kind of matter. It does not probe the deeper questions remaining for Theory of Knowledge in regard to any matter of thought. It belongs, for example, to Material Logic to explain the form, mainly deductive, that geometrical reasoning assumes and to determine the conditions of the valid proof of general statements in geometry; but what space may in the last analysis be, whether it is a subjective form of our sense-perception or has any kind of extramental reality—these are questions which do not concern the logician except in so far as the answer given to them in ultimate philosophical analysis can be shown to affect the question of the form of general statements in geometrical science. This it very well may or indeed inevitably must do: the present contention by no means is that Logic is not related to Theory of Knowledge. Not only, in the view here suggested, may Logic be regarded and treated as a special department of the general philosophical theory, but, even when constituted into a separate doctrine (sometimes called a special science, though it is no science as mathematics and the rest are), it may constantly have to reckon with epistemological considerations—as the practice of all logicians shows who (like Mill) do not confine themselves to the mere form of thought. All the same, it is not to be confounded with Theory of Knowledge. It deals so exclusively with the one aspect (generality) of such knowledge as it deals with at all that, unless it be denied that this should or can be investigated apart, the line of demarcation is clear; and as it has not been doubted, from the time of Aristotle, that the aspect is one that can be treated apart, so neither will anybody doubt that it should be so treated who is interested in making knowledge scientific and is alive to the fact that it is of the essence of Science to be *general*.

If philosophy as Theory of Knowledge is thus perfectly consistent with or even includes the traditional conception of logic as a department of philosophical doctrine, we may next see that it consists as well with the conception of philosophy as Metaphysic, though taken in no sense short of that which is otherwise expressed as Ontology or Theory of Being. This sense of the word Metaphysic, historically best justified, is also that which is suggested by analogy with the meaning of Physic. Physic (in its widest application) is concerned about the being of things as they appear—about things only as they appear but yet as they appear to be. Metaphysic, as going beyond Physic, has then to do with the being of things as they are or with their being as the ground of their appearing. But how can such a notion of philosophy as ontological doctrine be entertained at this time of day? It is not only English psychologists, content with their 'mental phenomena,' that have abjured ontological consideration. When Kant substituted criticism of pure reason for dogmatic assertions about a sphere of supersensible existence, did he not establish for evermore that not Being but Knowledge was the proper subject of philosophy? The critical inquiry which he thus put foremost did not, however, preclude Kant from following it up with a 'Metaphysic' (of Nature as well as of Morals) as the proper fulfilment of philosophy; and nothing hinders the philosophic thinker who begins by defining his task (in relation to psychology) as Theory of Knowledge, from considering it as Theory of Being (Ontology) also. The one, indeed, is inevitably the other. The thing that is known, is known to be. The thing that is, is not otherwise than it is known. What it is important to understand—what has come in the progress of modern philosophy to be clearly understood—is, that no dogmatic assertion of Being is philosophically admissible. Before it can be determined what in any ultimate sense *is*, what the modes of Being are, it must first be determined what the modes of Knowing are, what in the ultimate sense *is known*. This is the idea common to the Critical and to the Psychological school of philosophy. But that is no philosophy which, after considering, by one method or another, what it is to know anything and what is or can be known, starts back from declaring what then must be understood really to be. Philosophy has not only to give the ultimate analysis of things in abstract terms (of subjective import), but must render account of the concrete realities of everyday experience, which in the truest sense *are* for us all because it is to them (animate or inanimate) that all human interest attaches—because it is they only that are conceived as having an intrinsic or extrinsic worth. The philosophy that attempts this is metaphysical in facing a problem that can be expressed in no terms of physical science. It is ontological in seeking to appreciate the ultimate meaning of whatever can be said to be.

It seems, then, that there is nothing within the possible range of philosophy that need remain sealed for the thinker who starts from the psychological base more than for any other. In point of fact, the 'English' thinkers, when in the properly philosophic vein, have no more than others been slow to declare how they conceive of things as, in the last resort, being. They are only chargeable with having allowed themselves to be led, by their method of approaching philosophical questions, into an unsystematic and disjointed treatment of them. The advantage to be obtained by a clear distinction of Philosophy from Psychology would tell in favour of both, but especially of Philosophy which thus far has had its development most hampered in a conjunction which has not seldom been a confusion. There is nothing to hinder the thinker who works up to philosophy by way of psychology from grappling with the general problem of Knowledge, in as thorough a spirit of system as has marked any of those, from Kant onwards, who have thought it the chief merit of their philosophy that it has been wrought out on a plane immeasurably higher or deeper than the level at which psychologists creep along. There is nothing to hinder, and his very psychology should rather urge him on to the work of systematic interpretation, for which it supplies the means as well as the motive. At least it is plain that no psychological thinker need philosophise less systematically than Kant, whose whole scheme of critical inquiry has its stages psychologically determined.

But, after all, the question is not whether psychologists can become philosophers—as, of course, they can if they will, or even whether psychologists are inevitably determined, as other scientific inquirers are not, to pass from conclusions of science to the probing of human knowledge to its foundations. The real question is whether the philosopher in this (or other) part of his task is specially helped by foregone psychological consideration; and this has not yet been directly met. The previous remarks, however, would seem to warrant an affirmative answer. If it can be shown (as here it has been suggested) that there is no problem of philosophy which the psychologist does not have specially forced on his attention at one or other stage of his science, while his science gives him the means of considering it with a definiteness of insight and in a methodical spirit which interest in the deeper meaning and issues of things does nothing of itself to guarantee, then it cannot be otherwise than helpful to come to the work of philosophy from the side of psychology. Though philosophical questions are not to be solved under the same conditions of strict verification as are possible in phenomenal science, philosophers as well as scientific men desire to gain universal assent for the solutions they propound. Philosophy, however differing from science in its subject-matter, yet aims at the form of science. It has been advanced most permanently, in all ages, by those thinkers who were familiar with the best information their time afforded in the way of special science. If, then, it appears that there is one science which, while it is related to the other sciences in method, has so far common subject with philosophy that it is with Mind they are both (in whatever different way) concerned, the *methodological* advantage of working into philosophy through the science of psychology is hardly to be denied—even though the practical proof may yet remain to be given by psychologists that they can be as thorough and comprehensive as they have hitherto been sober and cautious in their philosophic thinking.

Meanwhile it may be observed how psychological science, working within its own limits, has obtained results whose philosophical import is in surprising agreement with conclusions which it is thought the greatest triumph of a very different method to have been able to establish. Any regret, indeed, that may be felt at the isolation in which English thinkers have held themselves from the Kantian movement in philosophy—being content to work on from their psychological base as if it had never been questioned—is tempered when it is seen what independent progress they have been able to make upon their own line towards a common goal. That is no argument for maintaining the isolation, but may be held to prove that the method of psychological approach is not philosophically valueless, and gives ground for the belief that it has only to be more systematically followed out for the achievement of as great results as have ever been claimed for another way, while in this way the results are more likely to secure general acceptance. Let us, in concluding these remarks for the present, note but two points in the philosophical theory of knowledge which, since the time of Kant, may be regarded as placed beyond reasonable question: (1) that we know Space, abstractly, as a 'form' inclusive of sensation and, actually, as one great *continuum* (percept, not concept) within which all sensible objects are ordered; (2) that anything to be definitely called Object, as a sensible reality for all men alike, is a complex product of thought-activity working under common conditions in all. Now nothing is more remarkable than the different accounts which the earlier and the later English psychologists give of the perception of space and of 'external objects'. Compare with Locke's crude notion of space, as a direct and simple datum of touch or sight, the present psychological theory that we acquire perceptive consciousness of it by active synthesis, through muscular organs, of elements of (passive) sensation; or, again, compare with even Hume's insight (so greatly marked beyond anything in Locke or Berkeley) into the processes of intellectual elaboration involved in objective perception, the grasp that psychologists now have of the representative factors that more than any presentative elements explain how the percept appears as it does. I do not say, here more than before, that the psychological are the philosophical questions, but I say that there is no aspect of the philosophical questions which may not be better understood and more definitely treated because of the psychological insight that has been gained. There is nothing in Kant's philosophical analysis of either fact of cognition—nothing, that is to say, which from the point of view he places himself at may be unquestionably maintained—for which a positive psychological warrant cannot now be assigned; while it is psychology that gives the clearest demonstration of the limits that should be placed upon his assertions (especially as to the universality of the space-form as regards 'external' sense). If that be so, Psychology is amply avenged upon him for his despite.

LEIBNIZ AND HOBBES.[1]

THE recent discovery in the University Library at Halle of a large number of letters from the unwearied hand of Leibniz —surely the most epistolary of all great thinkers—does not thus far prove to have much philosophical importance. Dr. L. Stein, editor of the new *Archiv für Gesch. der Phil.*, has in the first two numbers of that review given a careful account of all the autographic letters found, to the number of 101; and the utmost that can be said of them is that they help to deepen, if that were necessary, the impression of Leibniz as a man to whose breadth and variety of intellectual interests there was no bound, but who yet could pursue with the utmost tenacity special scientific objects of his own,—as here the perfecting of his reckoning-machine, entrusted, from about 1700 (long after its first invention), to a Helmstädt mathematical professor, R. C. Wagner, his chief correspondent in the collection. There is promise, indeed, that in the next number of the *Archiv* some other of the Halle letters—but these only copies, though not before published—will be made to yield matter of philosophical interest, as touching the question of the scope and value of history of philosophy. Meanwhile it may be noted that the discovery at Halle is not the only addition that has just been made to our knowledge of Leibniz's amazing activity as a letter-writer. There has recently appeared vol. iii. of the division given to 'Correspondence' in the stately collection of *Die philosophischen Schriften von G. W. Leibniz* (Berlin, Weidmann), made since 1875 by C. J. Gerhardt, editor before of *L.'s Mathematische Schriften*. This volume was kept back while vols. iv.-vi. of 'Works' were being issued from 1880. Apparently, though the editor says nothing, some kind of supplement must still be in view, outside of the original scheme; various things remaining unaccounted for within either division, as, for example, the well-known correspondence with Samuel Clarke. With all his merits and his unique claims to the gratitude of Leibniz-students, Gerhardt, it must be said, has not in all respects chosen the happiest way of presenting the fruits of his research ; in particular, he might have been more forward with the reasons for some of his action in the past, and now he might have been less silent as to his actual intentions. There can, however, be no question as to the philosophical interest and value of the new, and hardly less of the corrected, matter which, in all his volumes (of 'Works' as well as 'Correspondence'), he has, with extraordinary labour, been able to bring forth from the recesses of the Royal Library at Hanover. In his latest volume—to go no farther back—at least one important interchange of letters (with Jacquelot, pp. 442-82) is made known for the first time; while other correspondences, more or less imperfectly printed before (some in merest fragment), are now set out with all desirable fulness and care. Among these are three: (1) with Thomas Burnett of Kemnay, a Scottish friend of Locke's ; (2) with Cudworth's daughter, Lady Masham, the comforter of Locke's declining years ; (3) with Pierre Coste, the French translator (in England) of Locke's *Essay*,—which throw so much new light on the relations of the German to the English philosopher that another occasion may be sought for giving some detailed account of them in these pages. At present there is something to tell, from another source, of the relation in which Leibniz stood to an earlier English thinker—a relation that had not before been half carefully enough studied, and which, indeed, has been wholly overlooked by most expositors of Leibniz, including Mr. Theodore Merz, who, in his excellent contribution to "Blackwood's Philosophical Classics" (see *Mind*, ix. 439), first set the great German fairly before English readers.

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[1] *Mind*, xiii. 312.

It is that earnest student of Hobbes, Dr. Ferdinand Tönnies, who, in a recent article in the *Philosophische Monatshefte* (xxiii. 557-73), has placed in a light as striking as it is new the intellectual debt of Leibniz to Hobbes. Leibniz, it may be well to remind the reader, was contemporary with Hobbes in the last third (1646-79) of the nonagenarian's life. It has long been known that the ardent young thinker, impressed at an early age by Hobbes among other of the new 'mechanical' philosophers, sought to enter into closer relations with him by a complimentary and interrogatory letter, written from Mainz in the year 1670. The letter was first printed, from a copy of it taken by Oldenburg through whom it was sent to Hobbes, in Guhrauer's biography of Leibniz, whence it passed without change into Gerhardt's vol. i. pp. 82-5 (having, by the way, its gist somewhat too loosely represented at p. 48). Now Dr. Tönnies has had the good fortune to find, in the same volume (4294) of Sl. MSS. in the British Museum with Oldenburg's copy (nearly correct in itself, but not always carefully followed by Guhrauer), a document that has all the appearance of being Leibniz's original letter. Of this he gives the first quite accurate transcript, appending to it a series of remarkably instructive "elucidations".

For the understanding of the development of Leibniz's thought—a subject of peculiar interest and difficulty—Dr. Tönnies's few pages make more really effective use than has yet been made of the rich material now rendered accessible by Gerhardt's diligence. It has recently been used, not without effect, by Dr. David Selver for two elaborate articles in the *Philosophische Studien* (iii. 217-63, 420-51, "Der Entwickelungsgang der Liebniz'schen Monadenlehre bis 1695"); but this careful writer, who ranges also over a wider field to good purpose, has overlooked, like others before him, the facts now discerned, with characteristic penetration, by Dr. Tönnies. When read in connexion with the various utterances in letters or other writings from 1663 which Dr. Tönnies has been the first to marshal, the letter of 1670 leaves it hardly doubtful that, up to this date at least, Leibniz was more deeply affected by Hobbes than by any other of the leading spirits of the new time. If as late as 1669 he could, in a letter to J. Thomasius, express a preference for the doctrine of Aristotle's *Physica* over that of Descartes' *Meditationes*, he cannot have been very familiar with this treatise, so purely philosophical in character as it is, and it may well be doubted, with Dr. Tönnies, whether he can by that time have read at all Descartes' chief work, the *Principia Philosophiæ*, which does contain a physical, as well as metaphysical, doctrine. To be sure, the letter of 1670 itself includes a very high-flown reference to the French philosopher, but there is every reason, notwithstanding, to believe that Leibniz's serious occupation with Descartes' philosophy followed upon the years from 1672 in which he gave himself with such ardour and brilliant success to the study of mathematics; as, probably, it then was from the sense of having so swiftly surpassed Descartes in mathematical discovery that he always continued more eager to accentuate their differences than their agreements in philosophy. On the other hand, we find him, by the year 1670, not only conversant with Hobbes's thought at all its stages, whether of principle or application, but evidently concerned to get some accommodation of it to those practical interests of religion which were uppermost with him all through life. The time was near when he could not retain the faith he may have had even in the mathematical pretensions of the *De Corpore*, but, as Dr. Tönnies shows, other ideas, logical, metaphysical and even physical, plainly to be traced to that work, remained always operant with him. The most signal, undoubtedly, is that reference by Hobbes, in *De Corpore* (c. 25, § 5), to the possibility of regarding all bodies whatever as endued with sense in so far forth as reactive, though he himself proceeds to urge that it should be limited to living creatures, which do not simply react but have special organs for the retaining of impressed motion or—as he interprets this—have memory. Leibniz clearly has the passage in view when, in the letter of 1670, he goes so far beyond Hobbes (in the direction of Descartes) as to doubt whether sense can be more properly ascribed to brutes than "pain to boiling water". But already in the following year, as Dr. Tönnies points out, he is found harking back, in the tract *Theoria Motus Abstracti*, to a position which is essentially the same as Hobbes's, though he gives it an affirmative expression, peculiar to himself, which is of the utmost significance in view of the Monadism of later years. Two sentences may here be quoted: "Nullus conatus sine motu durat ultra momentum, præterquam in mentibus. . . . Omne enim corpus est mens momentanea, sed carens recordatione." It did not escape Leibniz's contemporaries whence he had got his inspiration; for Dr.

Tönnies is able to cite the words of mournful reproach with which a forgotten G. Raphson, in controversy with Leibniz on the point, brings forward the very passage from Hobbes. Dr. Tönnies himself, in view of it, and in view of the further development of Leibniz's thought that may now be referred definitely to 1678 (since publication by Gerhardt of his marginal notes written on Spinoza's *Ethica* in that year), does not hesitate to describe his metaphysical doctrine as, in strictness, "a Hobbism that had taken up Spinozism into it," or, again, to say: for Leibniz "Hobbism is the true physics; Spinozism, the true psychology". However this may be,—and certainly account has to be taken of a number of still later stages of development, at least in expression, before Leibniz, close upon the end of the century, had final possession of his doctrine,—enough should have been said to show that Dr. Tönnies has done a real service in drawing attention to an aspect of it that in recent times has not been at all regarded.

The letter to Hobbes (then eighty-two) remained unanswered for all its compliments, which should not have been ungrateful to the old man amid so much hostile clamour as attended his closing years. Dr. Tönnies is doubtless right in ascribing to disappointment the petulant terms in which Leibniz, writing to Thomasius some months later in the same year, speaks, on Oldenburg's authority, of Hobbes as passing into second childhood. It must have been a transient shade of feeling, for some time later—apparently in 1672, from Paris—he began to address another letter of appreciative criticism to the aged thinker (given by Guhrauer and Gerhardt from the unfinished draft at Hanover). There is no evidence of their having met when Leibniz came over for some weeks to London, early in 1673; most probably, Hobbes was then in Derbyshire.

THE PSYCHOLOGICAL THEORY OF EXTENSION.[1]

THE effort so often renewed since the days of Herbart to construct a psychological theory of Extension has so far had results that appear to be hardly more satisfactory to those who may be supposed to maintain than to those who discount the enterprise in principle. Some recent treatment of the subject by writers whose scientific earnestness is above question makes it worth while inquiring what may be the reason of the discontent or disagreement in regard to it so patent among psychologists. For this purpose I will here assume, without argument against those of the other way of thinking, that there is nothing in our perception of Extension to set it beyond psychological analysis. It is one thing, indeed, to seek to determine (psychologically) how we come by the perception, and quite another to determine (philosophically) what import is to be ascribed to the extension of body or to the space it appears to fill; but, this borne in mind, there is surely no more legitimate, or even imperative, task than to attempt to explain how body comes to appear as spread out in what we call space. Now why has this question failed to get a solution commanding something like general assent? I would suggest that it is chiefly because of the way in which it is too often taken up. It should be taken up, as I will try briefly to show, *after* and not before, or at least in definite and express relation to, a certain other question. The point has not been overlooked by some—for example, Prof. Bain and still earlier writers—but it has not been urged with all the persistence or consistency that the case seems to require; nor has it yet (that I know of) been urged at all in relation to the later manner of stating the problem that has come into vogue under German influence.

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[1] *Mind*, xiii. 418.

Among recent work on the space-question from the psychological point of view, I refer, of course, chiefly to Mr. Ward's now celebrated article in vol. xx. of the *Encyclopædia Britannica*, and to the remarkable series of dissertations by Prof. James that ran through last year's *Mind* (1887). The work of these two writers may first be noted for the confession it seems to involve of something very like psychological impotence.[1] They have been, independently, driven to make assumption of an inherent character in sensation that brings them perilously near, if it does not quite carry them over, to the position of those who contend that a psychological theory must always include among the elements of the explanation, though it may be under some disguise or other, the very fact of extension to be explained. With Prof. James, indeed, there is no disguise and it is difficult to see in what respect he does not go over. All the pity that his historical epilogue showers upon Kantians that know themselves and (more liberally still) upon Kantians that know themselves not, does not alter the essential import of his own round declaration of a primitive experience of "bigness or extensiveness" in all sensation. Within their general assumption as to the nature of space, the followers of Kant have found it no less possible or necessary than Prof. James to inquire what are the precise factors of sense and intellect entering into our various perceptions of extension; and for the start it really matters very little, in the psychological point of view, whether space is called 'pure form' with (external) sensation for 'matter,' or whether we are told, as by Prof. James, that "extensiveness" is an empirical aspect of sensation, justifying the use of such terms as "sense-space," "spatial feeling," and even "sensation of line or angle"! This novel kind of psychological speech, if fit to raise the hair of other people besides Kantians, does yet not keep himself from saying, with any Kantian of them all, "that, within the range of every sense, experience takes *ab initio* the spatial form" (p. 30).

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[1] Compare Mr. F. H. Bradley's incidental remark in *Mind*, xii. 369 n.: "All the attempts which I have seen made to derive extension from what is quite non-extended in my opinion break down". Mr. Ward had expressed himself to similar effect thus (*E. B.*, xx. 53 b): "The most elaborate attempt to get extensity [? extension] out of succession and coexistence is that of Mr. Herbert Spencer. He has done perhaps all that can be done, and only to make it the more plain that the entire procedure is a ὕστερον πρότερον." Whether Mr. Ward's own derivation of extension from or with help of 'extensity' is more satisfactory to Mr. Bradley does not appear. At all events, it is not covered by his remark; for the extensity claimed (as well as intensity) for sensation cannot be understood as "*quite* non-extended," if it is to do the work of explanation which, without it, Mr. Ward considers so hopeless. As to ὕστερον πρότερον, on one or other side in the case, something is to be said above.

"*Ab initio?*"—there lies, in regard to the fact of "spatial form," the question for the psychologist as it has come to the front in this century, not least by reason of Kant's (philosophical) analysis carried so much deeper than anything attempted before. Let it, however, be observed in passing that, even for the psychologist, the question is not so much of beginning of the individual's mental life—in respect of which the truth may lie one way or the other according as the evidence, if only it could be forthcoming in any decisive shape, may determine—as of beginning of scientific consideration.[1] Is the spatial form, in which at least some (we need not now ask whether all) sensations are experienced, so inextricably present with them from the first and always, that it cannot be viewed apart and reasonably shown to have a derivation from certain mental data presumably simpler? Now the allowance may at once be made that data of the kind usually assigned, at least in the way they are assigned or usually employed, fail to afford a satisfactory explanation. The data are 'muscular sensations,' in relation always with elements of (passive) touch and sight, and certain laws of intellectual grouping under which the sense-elements are supposed to be worked up. When the data of the so-called muscular sense are represented as 'feelings of movement,' the work of explanation is not, indeed, found difficult; but then, as has rightly been objected, the whole question is begged, since 'movement' plainly presupposes 'space'. If 'muscular sense' is understood in its purity as 'sense of effort,' we have, by the side of tactile and ocular sensation, merely another, though it may be a quite peculiar kind of intensive element; and the difficulty is then serious enough, how a variety of intensive elements can come, by any means of grouping, to assume in consciousness the appearance of an extended order. Through repetition, reversal, &c., elements apprehended at first in succession may very well end by appearing as coexistent, but it is still a far cry from coexistence-in-time to coexistence-also-in-space, which is the meaning of extension. How is the transformation to be effected? Or, rather, can it any way be effected? I do not know that it can, if sought for upon that line. But perhaps there may be no such difficulty, if it should appear that the problem of Extension is one not to be thus directly faced.

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[1] This is said not without reference to the argument conducted by Dr. E. Montgomery in his important series of articles on "Space and Touch" in *Mind*, vol. x. Dr. Montgomery's earlier contention, in the work on Kant with which he first came before the philosophical world (*Die Kantische Erkenntnisslehre widerlegt vom Standpunkte der Empirie*, München, 1871), seems to me to have lost nothing of its essential psychological value.

Doubtless, Extension is the fundamental aspect of the objective world as it offers itself to our apprehension. In our everyday view of things, which psychology has to render account of, space has the same appearance of external reality as the body that fills it; and extension is the one attribute that is common alike to body and to space. It must be a consideration of this kind that induces even Prof. Bain, with whom extension later on takes a secondary place, to begin his whole psychological doctrine with a distinction of "object" and "subject" as the Extended and Unextended —a distinction which Descartes and others are there to support with the metaphysical assertion that extension is the one essential attribute of whatever *is* other than mind. However it be with the metaphysical fact, which does not now concern us, certainly we must grant to the full the universality of the problem of Extension as it offers itself to the psychologist in regard to the world of sensible experience. It does not, therefore, follow that the problem is the first to be attacked in working out a theory of objective perception. Extension is the fundamental aspect of sensible object only in a logical point of view. There is every reason for asserting that it is not the historical *prius* in our actual apprehension of object. Will any one, upon reflexion, maintain that a child becomes aware of Space, which is extended and only extended, before it is aware of Body, which is resisting as well as extended? It cannot seriously be doubted that we arrive at our perception of space by a literal evacuation of, and thus after, the fuller and more impressive perception of body. Now, if this be so, we surely have here the right clue to the order in which psychological explanation should be attempted.

The difficulty of the problem in the form now commonly given to it lies, we have seen, in getting elements of experience, all in the first instance describable as 'intensive' only, to acquire the 'extensive' character. Intensive experiences continue always to be referred to the subjective mental stream flowing on in time. On the other hand, experiences of the extended order—without ceasing to be interpretable as *experiences* (else they would not concern the psychologist)—have the appearance of being detached from the mental stream; and are then called 'objective'. Now so long as no suggestion of a reason is afforded why they should thus become detached, the difficulty remains unsolved. Within the mental stream intensive elements may, in the way before mentioned, become aggregated into what appear clusters of concurring events, but upon that line nothing more seems possible. Let them, however, in the form of such time-clusters, be experienced in connexion with something that is already construed as external object, and at once they may begin to take on a new character by reference to this. I have said 'external object' for the sake of definiteness, not because I am not well aware that the word 'external'—understood with reference to the bodily organism of the perceiver or in any other way—may be said, here again, to beg the whole question at issue. Upon the 'externality,' as such, no stress can rightly be laid at the outset. It is 'object' (in whatever vague or shadowy sense of a not-self) from which the start has to be made; and 'object'—as indeed the name implies—is just 'obstacle,' without at first implying anything more. All psychologists may be said now to be agreed upon this, that it is in the phase of resisted muscular activity that we first become conscious of a 'not-self' as opposed to 'self': not that we all at once achieve the distinction, but that we gradually attain it through experience of this kind. Analyse the experience, and again the elements are found to be merely intensive—intensity of (passive) touch varying with intensity of effort; yet here it is not to be denied that the touch is related to the effort in such a way as inevitably to suggest a cleft in conscious experience, which has but to be widened and defined for the opposition of self and not-self to become established. Now the point to be urged is that if only object, as bare obstacle to muscular activity of a touching organ, has already to any degree become differentiated in consciousness, a basis is got by reference to which the conjoined sensible experiences shown by analysis to be involved in any perception of extension may begin to appear—not as the simply intensive experiences, of one kind or other, which they are in themselves, but—as constituents of object (as not-self). In point of fact, the development of the two aspects of external (bodily) object—resistance and extension—will proceed *pari passu* as soon as a beginning of both has been made; or, to put the case otherwise, body will not come to be perceived as definitely external till it is also perceived as definitely extended (in relation to an extended organism of the perceiver). But the first beginning must take place somehow; and this, upon the view here contended for, is to be sought in that aspect of object (as body) which we call Resistance, rather than in that aspect of object (either body or space) which we call Extension.

Apartness—which is another way of saying Extension—needs, in short, for its apprehension that something be supposed already there in which the particular kind of this-and-that meant in the word 'apart' may be manifested. The mistake of the space-theorists, generally, is to seek for an extension that is extension of nothing at all. No wonder, then, that those of them who take their task most seriously, finding the means proposed insufficient but not exactly considering why, are tempted into transforming these by assumptions that practically supersede the psychological question altogether. Let, however, the 'something,' in whatever vague sense of an experience of resisting object, be first got—as got it can be on psychological ground—and there is no longer the same difficulty of construing as extension other (more complex and varied) experiences that are had in connexion with the first. A base is wanted for the psychological operation. A psychological base is not wanting.

The reader has now but to look at the theory of Perception elaborated with so much care by Mr. Ward in his *Psychology* to see how completely is there reversed the order of explanation here maintained to be the natural and effective one. Like others who have followed the German lead in this matter, but with an independence and a thoroughness of treatment all his own, Mr. Ward first works out a space-theory in the vague, and only afterwards, under the head of "intuition of things," comes across the kind of considerations here regarded as fundamental in any psychological doctrine of perception. See, especially, what he says upon the second and the fifth of the "points" which, in the following order, he distinguishes in the complex presentation of an orange or piece of wax—(1) reality (actuality), (2) solidity or occupation of space (impenetrability), (3) continuity in time, (4) unity and complexity, (5) substantiality. Now, certainly, the intuition of "thing" is the culminating fact of perception—so much so, indeed, that there enters, I venture to think, a good deal more into the psychological account of its "substantiality," at least, than Mr. Ward, for all his care in distinguishing those various moments, appears to recognise—but the psychologist is not therefore justified in keeping back till the later stage all reference to the simplest, the earliest and the most impressive of all our sense-experiences in the case. We do not first "attain a knowledge of space" by "movements of exploration," and then, "when these movements are definitely resisted or are only possible by increased effort," "reach the full meaning of body as that which occupies space" (p. 56 a). Rather, as I have sought to argue, we first, through simple and direct effort put forth, get some kind of vague notion of body as resisting, and then by more complex efforts that are found to procure tactile impressions (continuous or discrete, as the case may be)—efforts not interpretable as *movements* till they have done their part in the work of psychological construction—we distinguish this and that extensively within such body, and the body as a whole in relation to our own bodily frame; later still, distinguishing from such extended body the (empty) space which it fills.

In Prof. James's elaborate theory of space-perception, the salient feature is not so much the direct consideration of extension by itself—though it is so considered—as the prominence given to questions of visual space, which it is his purpose to solve in terms of purely ocular experience. Upon this, it is not out of relation to the foregoing remarks to end with a certain note of interrogation. The service, indeed, should first be acknowledged which Prof. James has rendered to English psychology in forcing attention to questions which it has been too much the insular habit, since the days of Berkeley, to slur over with a merely general profession of Berkeleyan theory. There the facts of visual perception are, in all their variety and perplexity, as they have been made out by the patient labour of so many continental investigators. It is no small gain to have them now brought so definitely into English view, nor less to have them at the same time explained, with triumphant confidence, in the sense most shocking to English prejudice. But the query may not be suppressed: What is, then, with Prof. James and the physiological allies to whom he lends psychological authority, the meaning of visual perception? When, straightway at the beginning, he puts skin and retina without ado on one perceptive level, and applauds Hering's declaration that he, for his part, has ocular sensations not only of the surface-order but "roomy" altogether, one wonders if the thought has occurred to either how ocular sensations are had at all. It is not, of course, with eye only that we are visually conscious, nor again with anything that can be called 'visual centre,' more or less circumscribed as this may finally prove to be, in the brain; but (keeping, as for the present purpose we may, to physical terms) it is with the brain altogether—a brain that has never been known to develop the functional activity of perception without skin-impressions. People have lived and died without the use of eyes, but nobody has ever grown up with an insensitive skin. How can Hering, then, or Prof. James, with a perceptive consciousness of touches all-compact, say what the eye alone shall in the way of space-perception be able to accomplish? How show that "roominess"—or, for that matter, surface either—which *their* eyes may readily be credited with beholding and in fact cannot help seeing, is an affair of mere ocular consciousness? Nor, in asking such questions, is it at all implied that the eye does not give, or rather procure, us everything that is highest and most commanding in our space-perception. It is not even implied that, if we could suppose ourselves reduced to the eye with its exploratory movements as our sole and only means of constructing a spatial order, such a construction might not come to pass—however far removed it would be in character from that of our actual experience. All that is meant is that, dependent as we are for all our basal experiences upon locomotive organs that are at the same time tactile, it is impossible for us through the eye to have a perception of space that is not ultimately, whatever its refinements of discrimination and consequent development of range, to be referred to the tactile base. This is the position that Berkeley took up, and it remains inexpugnable, let the particular ocular conditions be what they may that have further to be taken into account before our visual experience in all its detail is satisfactorily explained. But in the position, rightly understood, it appears to be no less involved, as I have here sought to maintain, that the construction of tactile space needs again for *its* base a prior construction—no matter how inchoate—of tangible object.

DR. H. MÜNSTERBERG ON APPERCEPTION.[1]

Is the psychological function to which Prof. Wundt would appropriate the hitherto unsettled name of Apperception radically distinct from Association? This is the question to which Dr. H. Münsterberg more particularly addresses himself in the first part of that remarkable series of *Contributions to Experimental Psychology* which (as noted in *Mind*, Nos. 56, 57) he has begun to publish.[2] The question is not at all new, being in fact as old as psychology itself; but it has acquired a new prominence of late, in this country as well as in Germany. It has been urged upon us here, in the home of Associationism, that without positing a function of attention, subjective activity, activity of consciousness, will (or what not else, so long as the essential import be *activity*), there can be no scientific understanding of mind,—any more than it has been found possible in common life to speak of mental experience without words of active meaning. The special interest attached to Wundt's similar declaration in Germany arises from the experimental grounds on which he seeks to base it, or—what comes practically to the same thing—from the psychophysical attitude which he desires always to maintain in psychological inquiry. For, if Wundt asserts an apperceptive activity beyond mere associative process, it is not that he does not labour to interpret the one as well as the other in physiological terms. In spite of various expressions which have led others (like Prof. Bain in *Mind*, xii. 174) besides Münsterberg to doubt whether he thinks it of universal application, it is not really to be supposed that the prime champion of the psychophysical method in this generation is not as much concerned as any of his critics to obtain by means of it the necessary basis for strict experimental investigation over the whole mental field. Now when assertions are based on experiment there is the signal advantage that by experiment they can be decisively tested. This, then, is the task which, in regard to Wundt's doctrine, by preference over any other assertion of an efficient activity of consciousness, Münsterberg has undertaken in the first of his published researches, bearing the special title of "Voluntary and Involuntary Combination of Ideas".

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[1] *Mind*, xv. 234.

[2] *Beiträge zur experimentellen Psychologie.* Von HUGO MÜNSTERBERG, Dr. phil et med., Privatdocent der Philosophie an der Universität Freiburg. Heft 1. Freib. i. B.: J. C. B. Mohr (Paul Siebeck). 1889. Pp. xii., 188.

This memoir, like others that have so far followed it in the series, has the noteworthy feature of not putting forward any elaborate tabulation of numerical results, but of presenting these in the most highly condensed form consistent with intelligibility and serviceableness for inference. A deft and untiring experimenter, it is yet about the reasoned interpretation of his results that Münsterberg is chiefly concerned. Not only, therefore, does he include with all his researches (in their published form) a careful review of previous work done on the subject of each, and develop at length the conclusions to be drawn from his own experiments, but he places in the front of his *Beiträge* an argumentative statement of the aim and method of his whole inquiry. To those who may have come to think that the proof of recent advance in psychology is to be found in the new fashion of severe numerical presentation, Münsterberg's wealth of argument, often polemical, may seem to indicate a falling-back into earlier unscientific habit; but, surely, it is not so. There is not yet such universal agreement in matters of psychological principle that all that remains for the scientific inquirer is to sink himself in special questions and heap up experimental values in bald tabular form. Questions of general principle are still among those that most need consentaneous determination; and if this is to come, as it can now only come, by way of rigid experiment, no prior or sequent discussion that helps to make the experimental test more precise and telling is anything but in place. Apart from a certain disposition to range somewhat widely in argument and perhaps some superfluous repetition,—which it would be well to repress and avoid as far as possible in the interest of an enterprise that has to make its way with readers but is now (after its third part) clearly not going to fail through shortcoming of its author,—it may fairly be said of Münsterberg's experimental work that it has peculiar value just from being so pointedly prepared by general consideration and driven so completely home.

Coming now to the direct aim and purport of his carefully planned scheme of research, it certainly cannot be charged against Münsterberg, however it be with others, that he does not constantly bear in mind the necessity of making no psychological assertion that has not its definite physiological counterpart. While his investigations are declared to be psychological—that is to say, neither physiological on the one hand nor metaphysical (philosophical) on the other—they are yet psychological in a sense that keeps the physiological reference ever in view. Not that he denies the possibility or legitimacy of a purely subjective psychology, working with its own appropriate conceptions and hypotheses. This he does as little as he fails to see, from the philosophical point of view, that physiological facts, like all other facts of objective science, can have ultimate expression only in terms of conscious (which is properly subjective) experience. But within the range of phenomenal science, where facts of nerve-physiology stand in obvious relation with facts of subjective psychology, he is most of all impressed by the circumstance that the one class—objective as they are—lend themselves to a definiteness and a continuity of representation unattainable with the other. It is, then, psychophysical consideration which he aims at carrying consistently through, in the interest of a scientific understanding of mind. And the prime question, of course, is how the facts of (subjective) consciousness are to be conceived, for this to become possible.

To this question he replies with all due explicitness in his introductory sections (pp. 1-63) on "Consciousness and Brain": not for the first time, indeed, for he had already faced the question in a previous critical essay (*Die Willenshandlung*, see *Mind*, xiii. 436), where he sought to work out a psychophysical theory of Will in all its manifestations, low or high. The difficulty is where conscious experience seems to be of a sort that can only be phrased (subjectively) in terms of action. It is not always such; for there is now what may be called a general allowance, that muscular reaction innervated from the brain under stimulus from afferent nerve is an adequate physiological expression of the simpler kind of psychological experience covered by the name Sense. Such mental aggregates, too, as are plainly of associative origin are hardly denied to be representable by definite brain-configurations,—whatever difference of opinion may remain as to the exact (subjective) analysis of Association. The difficulty, no doubt, is already there, or still earlier at the stage of Sense, in as far as either of these kinds of experience may be held, after all, to import some degree of conscious activity; but it becomes most truly marked where Volition for personal ends, or Thought as subjective reaction upon the multiplicity of experience that passively accrues, is in question. Here it is that Wundt finds it necessary to oppose to anything that can be called Association a function of Apperception,—which he leaves in general with purely subjective expression, though at times seeking to connect it in a more or less halting way with process of the frontal brain-lobe. Münsterberg, on the other hand, makes it his express care to see whether the phrasing in terms of activity of consciousness, which so ill bears physiological translation, is as indispensable subjectively as it is not denied to be subjectively admissible. By way of analytic inquiry, directed especially upon that notion of conscious Ego or subject to which is ascribed the power of striking actively into the stream of mental occurrence, he claims that not less admissible is another manner of psychological statement for which the corresponding physiological expression is not so far to seek. The problem, in fact, as he urges, is to interpret all that is called activity or change of consciousness as change of conscious *content*. So interpreted, there need be no more difficulty (beyond greater complexity of statement) in finding the physiological formula of thought or volition than of bare memory or sense. But to Münsterberg it is at the same time clear that, in thus transposing the psychological theme for consistency of scientific understanding, the limit of possible explanation should be well observed. The fact of consciousness itself, with all that it directly implies,—for this, he holds, there is no meaning in seeking a physiological expression. In other words, it is the empirical Ego of psychology—not the pure Ego of philosophical consideration—whose doings it is possible to interpret in terms of subjective "content," and thus render translatable into the other language employed by psychophysical science. There is the more need to note this point which Münsterberg so explicitly makes, because Wundt, if prone to bring consciousness as an unknown quantity into psychological explanation, has yet committed himself (like others in these days) to the general position that consciousness has its physical expression in terms of the collective functioning of the brain (or nervous system). Between the two investigators, it may seem a case where the adage holds true that the half is more than the whole. Consciousness with its fundamental activities of discrimination and assimilation (or however they are expressed) may very well be taken as simple assumption not needing or admitting of any other kind of expression,—provided that none of the specific questions of our mental life with which the psychologist has to deal, remain withdrawn from the kind of scientific determination that has been found so effective with some.

For, now, the peculiar importance of Münsterberg's work lies in the kind of questions which he is able, from his point of view, to subject to experimental treatment. The point of view has often been taken before, if never, perhaps, with such careful discernment of the issues involved: what no one previously has done is to make so good a beginning of turning it to scientific account in detail. The question being this—whether there is anything in so-called apperceptive activity that takes it outside the sphere of associative process (assumed to be psychophysically intelligible), Münsterberg seeks to approach its determination by two different lines of experiment. The first is directed to seeing whether, in circumstances progressively more complex than in a certain simple case of reaction where, according to Wundt, apperceptive activity of consciousness must already be supposed at work, there is not evidence that all that goes forward is unconsciously performed, in a manner that can only be physically represented. The other is an attempt to bring acts of judgment or choice (as all would call them) so into relation with cases (as commonly described) of mere association, that whatever psychophysical account may be given of these must be held equally applicable to those.

I. The first inquiry makes use of a distinction established experimentally by L. Lange, one of Wundt's pupils, and interpreted by Wundt himself in accordance with his apperceptive theory. The time of reaction to sensible impression is found to vary according as the reagent's attention is directed to the impression to be received or to the movement to be put forth. It is considerably longer in the former case; and this being interpreted to involve a specific act of conscious apperception (of the impression) absent in the other case—where the reaction is supposed to follow with the directness (as it were) of a reflex movement—the 'sense-reaction' is spoken of as 'complete,' the 'motor reaction' as 'shortened'. Now Münsterberg bethought him of seeing how the relation of the two kinds of reaction might turn out in circumstances where the shortening could not be supposed due to the effect of habit—rendering the act (secondarily) automatic. For this he decided to work with the five fingers of the right hand, and get a reagent (Dr. *Thumb*, as it happened) to respond with movement of particular finger to particular stimulus, and eventually to particular *kinds* of stimulus that gave progressively more and more scope for what might seem to be conscious discrimination and identification. The apparatus employed did not in principle differ from that used in the simple reaction-time experiments of Wundt's laboratory, and all this part of the case may here be passed over with the remark that nothing in the way of care or precaution seems wanting to the work. Sound uttered by Münsterberg himself was the stimulus chosen, and the time was measured in thousandths of a second (σ) between his utterance, synchronising with pressure of a knob, and the reagent's movement of response, consisting in the raising of particular finger from a keyboard on which the five were at rest. The first point to ascertain was whether all the fingers could be raised upon stimulus with equal readiness, and this, after some practice, was found to be the case. Then the experiment went forward in a way and to a result that may be summarily described as follows.

The reagent's time (1) with any finger being found, upon average of many trials, to be 160σ, 120σ, respectively, for 'complete' and 'shortened' reaction to uniform stimulus, he was next tried with different stimulus for each finger. Thus (2) the thumb was to be raised at sound *one*, and so on to last finger at sound *five ;* here after due trial, of course in pell-mell order of utterance, the figures became 383, 289. Again, (3) the words appropriated to the different fingers in order being *lupus, lupi, lupo, lupum, lupe*, the figures obtained with this quite artificial association were 465, 355. So far, the object was only to give practice in definiteness of response, the possible effect of habit not being eliminated. But now (4) there were at one and the same time allotted to the fingers in order five cases of the three pronouns, *ich, meiner, mir, mich, wir ; du, deiner, dir, dich, ihr ; der, des, dem, den, die*, and a particular finger had to be raised to any one of three different sounds uttered irregularly from among fifteen in all. Here, where there no longer could be question of fixed association but there had to be constantly renewed discrimination, the time for the two kinds of reaction rose to 688, 430. And from this point emerged, under progressively more difficult conditions, a very remarkable result. The thumb, forefinger, &c., were to be raised respectively upon random utterance, (5) of any *noun, adjective, pronoun, number, verb ;* (6) of the name of any *city, river, animal, plant,* (chemical) *element ;* (7) of the name of any *poet, musician, naturalist, philosopher, statesman* (or *general*). Here, in accordance with the increasing difficulty of identification, the time for 'complete' reaction rose from the 688 of the previous case to 712, 893, 1122 ; but the time of 'shortened' reaction remained practically constant, being 432, 432, 437 by the side of the 430 of case (4). There was also the notable circumstance that only from case (4) onwards did errors—of raising the wrong finger (generally as between fourth and fifth)—occur, and this always in connexion with the 'shortened,' never with the 'complete,' reaction. The errors in the different cases were respectively 10, 30, 12, 25 per ct.; where the excess in case (5) admits of sufficient explanation from the difficulty of finding words (always of one syllable) that, as sounded, might not be referred to more than one head, *e.g.*, the pronoun *sie* being in utterance indistinguishable from the imperative *sieh*.

These figures, which are startling enough, have an obvious bearing on the question whether the exercise of apperceptive function (however this may or may not be physically conditioned) makes the whole difference that has been alleged between the two kinds of reaction; also upon the question whether work of the consciously active (or actively conscious) sort is as necessary as has been supposed for the attainment of certain intellectual results. If, without first consciously attending to a particular sound (*i.e.*, discriminating and identifying it), and without then consciously deciding to put forth one particular movement rather than any of several others in response to it, the movement is, in general, found to be rightly put forth apart from such consciousness, provided only the system (call it mental or nervous) is by prearrangement poised in more or less determinate fashion,—why, then, the part commonly reserved for direct activity of consciousness must, surely, be allowed to be one that is by no means indispensable. But, before remarking further upon the interpretation which Münsterberg would put upon the results of his first series of experiments, let us in like manner have summary view of what he attains with his second.

II. The second research has a relation to previous experiments on Association-time, especially those carried out at Leipsic with so much care by Prof. Cattell (see *Mind*, vol. xi. *passim*), but is guided by a different principle, and seeks to bring experiment *directly* to bear upon mental processes of the higher or more recondite sort. Hitherto it is indirectly, by way of calculation, bare reaction-time first discounted, that it has been sought to get a 'recognition-time,' a 'will-time,' and with these also an 'association-time'. For Münsterberg, on the other hand, the main question just is, whether the mental processes here distinguished do in any case so join on in serial order, the one ending before another begins, as to be thus separable by calculation. And he would solve it by working up experimentally from relatively simple cases of intellection to others which plainly involve judgment and will. The method of experiment was to require of two reagents, M. and R. (Drs. Mayer and Rieger), to utter alternately, ten at a time, single words in response to questions of different degrees of complexity conveyed to them by Münsterberg's utterance, in such way as that the time could be accurately measured between question and response,—by having the two utterances combined with simultaneous finger-movements that respectively closed and opened the galvanic current of the registering apparatus. In the graduated series of questions put to the reagents, the earlier ones involved nothing more than request for an associated name; but, as Münsterberg urges, this cannot be sought for under experimental conditions without implying some kind of judgment in the response, since even in the case of freest association it must really be an associate of one kind or other, and not any name whatever. Thus it is possible, for purposes of comparison, to bring what are called involuntary associations effectually into line with such judgments as obviously import choice and volition.

Beginning was made (1) with simple repetition of the call-word, yielding a mean time for M. of 403σ, for R. of 362σ. ('Mean variation' is added throughout, in proof of the care taken in averaging the thirty or forty trials made with each reagent at every stage of the experiment, but may here be left aside.) After this preliminary, the experiment went forward in a way that may perhaps be more clearly conveyed by giving at each stage some examples of the type of questions put and answered, rather than by any general designation of the different types:—

(2) Associate of 'Gold'?—'Silver.' 'Strength'?—'Force.' 'Sing'?—'Dance.' M. 845, R. 948.

(3) 'Greek poet?'—'Homer.' 'Drama of Goethe?'—'Goetz.' 'Prussian town?'—'Berlin.' M. 970, R. 1103.

(4) 'Three times four?'—'Twelve.' 'In what season of the year, June?'—'Summer.' 'Teacher of Plato?'—'Socrates.' M. 808, R. 889.

(5) 'Which more important, Virgil or Ovid?'—'Virgil.' 'Which do you like better, wine or beer?'—'Beer.' 'Which

seems harder to you, physics or chemistry?'—'Chemistry.' M. 906, R. 1079.

(6) 'Among apples, pears, cherries, &c. (nine others named), which do you like better, grapes or cherries?'—'Cherries.' 'Among ten trees named, which more picturesque, lime or oak?'—'Oak.' 'Among ten colours named, which goes better with blue, yellow or green?'—'Yellow.' M. 694, R. 659.

(7) 'Most important German river?'—'Rhine.' 'Finest of Goethe's dramas?'—'Faust.' 'Your favourite French poet?'—'Corneille.' M. 962, R. 1137.

(8) 'Which lies more to the west, Berlin or the most important German river?'—'Rhine.' 'Which letter comes later in alphabet, L or the initial of the most beautiful tree?'—'T' (*Tanne*). M. 1844, R. 1866.

(9) 'Which lies more to the west, Berlin or the river on which stands Cologne?'—'Rhine.' 'Which is less, 15, or 20 *minus* 8?'—'12.' 'Which letter comes earlier in alphabet, P or initial of our emperor?'—'F' (Frederick). M. 1291, R. 1337.

(10) 'Among twelve bodily organs named, which larger, hand or what one smells with?'—'H.' 'Among twelve colours named, which brighter, blue or colour of sulphur?' 'Yellow.' 'Among twelve poets named, which lived later, Lessing or Byron?'—'Byron.' M. 1153, R. 1145.

Finally, (11) 'Which more impressive, the finest drama of Shakespeare or finest opera of Wagner?'—'Lohengrin.' 'Which more picturesque, the most beautiful fruit or the most beautiful flower?'—'Rose.' 'Which of greater importance to man, the most important application of electricity or the most important use of gunpowder?'—'Telegraph.' M. 2197, R. 2847. But here the 'mean variation' was so exceptionally large that the limits of intellectual complication with which direct experiment can effectively cope appeared to be overpassed; and, accordingly, the result was discounted.

Now, of course, the value of these results, though they seem to have been obtained with all imaginable care, must not be overrated. Münsterberg himself is the first to see what weakness there is in any of them; as, *e.g.*, especially in all those of them—(5), (6), (7), (8)—that involve what he calls a "subjective judgment of decision". Whether the subjective estimate was asked for between two alternatives only or within an indefinite range, the experimental decision was (as it had to be) made with an *aplomb* far enough removed from the hesitation of ordinary life;—as was shown, for one thing, by the disposition the reagent would immediately betray to go back upon the particular preference he had so confidently expressed. Still it is evident that, from (2) onwards, the more salient kinds of intellectual activity—these, too, carried, from (7), to some considerable degree of complication—are in a way fairly represented. And in this view, not a little remarkable the results are. A free association, as in (2)—which Münsterberg here calls "unrestricted judgment of relation"—has always been readily understood to take shorter time than such a restricted association (or judgment) as is involved in (3); while this again may take somewhat longer time than the singularised or exclusive determination of (4). But, when the subjective appreciation involved in (5) took by itself a time which approximated to that of (3), it was certainly not to be expected that it could be superimposed, as in (7), upon the work of (3) within a time, for the whole complex process, which is practically the same as that of (3) by itself. Again, while in (8) the addition of an act of exclusive choice to the work of (7) brings the time up to a figure which, for M., is almost double, it is curious to see how comparatively little the same kind of addition to (4) increases the time of this by itself. Once more, the shortening effect wrought upon (5) and (9) by such a foregone enumeration of relevant particulars as was employed in (6) and (10) is remarkable enough. Other points of interest might be noted in the figures, as, *e.g.*, between the two reagents, how R., although (after the first simple reaction) his times are otherwise pretty uniformly longer than M.'s, responds with exceptional swiftness under the peculiar conditions of (6) and (10). Most important, however, is the main outcome of the whole series of experiments, and this is—that the actual work of intellect is done in a way which cannot be represented by any summation of such elements or factors of conscious experience as subjective analysis may discern in these or similar cases of mental complication. If, wherever an 'apperceptive act' can be noted in any of the foregoing associations or judgments, it must be supposed to engross consciousness for the time being—and this cannot but be supposed, whether or not the 'act' may admit of satisfactory physiological expression—then the time-values in the great majority of the cases ought to have turned out larger, and to have been otherwise very different (in comparison with one another) from what they were found to be.

Taken together, the two researches in their different way certainly point to one conclusion—that there is no such difference between so-called voluntary and involuntary intellection as Wundt's apperception-theory (or any other like it) would make out. The effective mental work which gets itself somehow performed in these experiments of Münsterberg may be set down, in the language of subjective psychology, to activity of consciousness; but this activity conforms to no law that can in any way be traced, or, in other words, no scientific account of it can be given. On the other hand, the experimental results do not seem to withdraw themselves from consistent psychophysical interpretation. In II., the salient feature is the comparative shortening of time taken up by the more complicated mental processes. Where there is any marked increase of time for the complex over the relatively simple, this is yet out of all proportion less than the degree of complication (subjectively viewed) would seem to require. In I., the salient feature is the practically constant time within which intellectual acts (for they are, to all intents and purposes, intellectual) of varying complexity are effected, so soon as the performance is allowed to take place in the way called unconscious. Here, unconscious performance means that the motor result finally obtained is effected in a way that is physiologically imaginable (though in detail it cannot be actually traced). That is to say, there is understood to be a physically continuous process all the way from where stimulus is received till where, by more or less circuitous cerebral route, the terminal station of overt impulse is reached. But if the time between stimulus and reaction remains (practically) constant though the cerebral work varies as much as it must do between cases (4) and (7) of Münsterberg's first research, there must here be some overlapping of stages in the whole brain-process, such as with physical process it is not unimaginable there may be. Now the very point, it will be remembered, of the first series of experiments was to get work done which, though 'unconsciously' performed, had all the character of that kind of work which, before habit is formed through practice, consciousness alone is supposed able to effect. Where, then, as in the second research, it is a question of understanding how conscious process may go forward at a rate much swifter than could be if all the stages of conscious activity apparently involved were in serial order gone regularly through,—it lies to hand to suppose that the real causal chain (eventuating in the final movement) is a physical one of nerve-process, which, according to circumstances, may be more or less cut short.

Such is a general—very general—indication of the meaning put by Münsterberg on his experiments. The English reader will perhaps call to mind the passage in Mill's *Examination of Hamilton* where, over against Hamilton's hypothesis of 'unconscious mental modification,' and Stewart's hypothesis of fleeting conscious modification straightway forgotten, the idea is thrown out that lapsed elements in trains of association that continue effective may correspond to the opening of physical short cuts through the brain; the same mental result being thus attained directly that would otherwise be reached more circuitously with full consciousness. In Mill, the supposition, where it is made, has a certain forced effect, because in general he shows himself so little anxious to rely upon psychophysical consideration or carry it through. It is, accordingly, rather in the writings of so earnest a physiological psychologist as Prof. Bain; or of so fervent a depreciator of consciousness and all its works by the side of brain-process as Dr. Maudsley; or, again, of a thinker so firmly convinced as Mr. Shadworth Hodgson that, after *philosophical* analysis of experience, there is nothing left for psychology to do but to find coherent physiological expression for the facts of subjective consciousness,—it is in the writings of these that the nearest English approaches must be sought to the position taken up by Münsterberg. But, as has been already said or implied, what distinguishes him from the writers named, or from any others who in this country have conceived of the physical series of nervous events as bearing the whole causal strain ('causal' understood phenomenally) of the chequered play of mental life, is just the experimental art which he brings to bear upon special questions of psychology; so that the position no longer remains open to the charge of being a barren generality incapable of proof or disproof. Or, rather, this is his first point of distinction; for the present attempt to draw attention to his work should not break off without at least mention of one other notable feature in it.

It was noted above, under II., how according to Münsterberg the demand, under any kind of experimental conditions, for even the least restricted association involved already some act of judgment on the part of the reagent. But, if in this way he made good the continuity of his experimental tests from simple up to complex judgments, it is not thus that he leaves the question (as between Association and Apperception) at the final stage of psychophysical interpretation. If his general formula is to stand—that all activity or change of consciousness must admit of being represented as change of conscious content—the explicit judging (or choosing) at one end of his experimental scale should, equally with the implicit judging at the other, bear to be expressed in terms of Association. He has, therefore, to grapple at length (pp. 123-41) with the psychological question of the exact nature of the associative process and of Thought in relation to it. It is the question which English Associationists have tried always, more or less directly, to face,—never more directly (upon a line of his own) than in the article on "Association and Thought" by Mr. F. H. Bradley in *Mind*, xii. 354. Münsterberg's treatment is of a range and character to which no justice can be done on the present occasion, but it is specially commended to the notice of readers—for more reasons than one. As a piece of subjective analysis, it shows, in comparison with most of the English efforts, a superior grasp of the precise issues in question; and it is worked out—as the best English treatment has not always been, and sometimes has not been at all—with an eye kept steadily fixed on the physiological aspect of the case. One point only may now be noted, in this (latter) view. Münsterberg takes side with those who reduce all association to the one form of 'Contiguity,' but finds himself also obliged to go further, and limit this to the single case of 'Coexistence-in-time'. It is not clear to me that he thereby overcomes the very serious difficulty there is in getting a satisfactory physiological expression for 'Contiguous Association' (as very serious difficulty there is, in spite of what one could write, with the brave confidence of youth, in the *Encyc. Brit.*, 9th ed., art. "Association"). But the exact *crux*, as it has now long seemed to me, of the matter I have not elsewhere seen so clearly expressed or apprehended as by Münsterberg from p. 130.

These remarks must for the present suffice. Dr Münsterberg is fulfilling his promise of serial publication so punctually that there will be occasion enough to return upon his work. It is a work of genuine research that is all the more remarkable from being done (as I have read somewhere) without any of the official aids and facilities that belong to a higher academic status than he has yet attained. Among the psychological questions which he has most made his own—in connexion with the half-dozen or more researches he has so far published, as well as in his earlier essay on the *Act of Will*—is that deep-going and far-reaching one of 'Muscular Sense'. The decided position, after more than commonly circumspect consideration, which he takes up on this critical subject, will, it is hoped, not be passed over the next time his work is had under review.

SOME NEWLY DISCOVERED LETTERS OF HOBBES.[1]

DR. F. TÖNNIES has discovered, in the National Library at Paris, seventeen letters of Hobbes to the French physician Sorbière, who saw the *De Cive* through the Amsterdam press in 1647, translated it into French in 1649, followed it in 1652 with a French translation of the *De Corpore Politico*, and remained Hobbes's devoted admirer to the last. Dying in 1670, Sorbière left a large mass of correspondence which he had carried on with the notorieties of his time; and this was presently prepared for the press by his son, but did not get into print. It is in the MS. collection so prepared (now preserved in the Paris library) that the Hobbes-letters have been found. Dr. Tönnies gives the whole seventeen at full length (omitting only some useless mathematical matter from the 16th) in the *Archiv f. Gesch. d. Phil.*, iii. 58-71, 192-232, with related letters of Sorbière himself, Mersenne and others, and the necessary commentary; this last marked (in spite of some doubtful statements) by all the high characteristics that have distinguished his previous writing on Hobbes. He quotes as from Nicéron (*Mémoires des Hommes illustres*, iv. 96) a reference to the unpublished collection (prepared by the younger Sorbière, 1673) which I cannot find in the 1727 edition; but as to the genuineness of the Hobbes-letters there can be no question with any one that knows those facts and circumstances of the philosopher's life upon which they cast a welcome new light. Five of the seventeen—not the most interesting of the series—did (according to Dr. Tönnies) get into print as early as 1669, in a small collection issued by Sorbière himself, which has become one of the rarest of bibliographical curiosities. Below are given, with a minimum of comment, the first nine, having reference to the really important period of Hobbes's life and work that led up to *Leviathan* in 1651. After the 9th letter in 1649, a break ensued in the correspondence, and, when it was resumed from 1656, the (eight) letters that have been preserved (till 1663) are of such minor importance—having reference mainly to the scientific polemics of Hobbes's old age—that they may be left to the scholar to seek out in the *Archiv*. The general reader, on the other hand—if not deterred by the careless Latin in which so great a master of English, and also in his books effective enough Latin stylist, was content to write familiarly—will find in the earlier letters not a few points of biographical or philosophical interest. Extant letters of Hobbes were before few in number.

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[1] *Mind*, xv. 440.

The first letter bears upon the new edition of *De Cive* which, from 1646, Sorbière had undertaken to bring out at the Elzevir press. The book, under title of *Elementorum Philosophiae Sectio Tertia, De Cive*, had appeared, quarto size, in 1642, at Paris; not anonymously (as Dr. Tönnies, misled by some correspondence at the time between Sorbière and Martel, another French friend of Hobbes, supposes) but still only with the initials 'T. H.' at end of the dedicatory letter to the young Earl of Devonshire. The few copies then printed having, as Gassendi said, excited rather than satisfied thirst, Hobbes was prevailed on by Sorbière, who towards 1645 had become personally known to him, to make a more effective publication. For this he provided a new preface and footnotes, while Gassendi and Mersenne supplied commendatory epistles. In the letter are to be noted his general distrust of professional rivals and his special suspicion of Descartes (whose correspondence, however, shows no mean appreciation of the *De Cive* on its first appearance); cp. *Hobbes* ('Blackwood's Phil. Classics'), p. 58.

I. Ex literis tuis ad D. Martellum nostrum quibus te venisse Hagam cognovi incolumem, hoc ipso die (mi Sorberi dilectissime) cepi voluptatem, quam tua bonitas et timor itinerum, incommoda atque pericula sola recordantis, non patiebantur esse mediocrem. Itaque quod molestis illis cogitationibus primo tempore me liberaveris, id quoque amicissime a te factum est. Quod in iisdem literis praefa-

tionem meam laudas, secunda voluptas erat, nam et delector judicio tuo, et quamquam nimium laudas, tamen affectus quo id facis ad id quod ago utilis est, nam ut typographo spes fiat fore ut liber ille vaeniat, laudatoribus et magnis et quibus credi possit opus est. Itaque et D. Gassendus et R. P. Mersennus librum illum hyperbolice laudaverunt, mihi arte [? certe] potius quam sibi satisfacientes; quorum utriusque literas jam pridem te puto accepisse. Quae editionem impedire posse videntur, sunt primo si ejusmodi librum scierint sub praelo esse ii qui dominantur in Academiis, ad quorum pertinet existimationem ne quis in ea doctrina quam profitentur viderit quod illi prius non vidissent. Itaque tacite peragendum est, nec quaerenda testimonia nisi quae obtineri posse certo scias. Neque ergo si prohiberi potest, typographo permittendum est homines suo ipsius judicio doctos de libri utilitate consulere. Deinde cavendum est ab iis qui cum pleraque probent, reliqua improbant, nam magistros agunt, ac laude quam privatim ipsi mihi tribuunt contentum me debere esse putant, publicam invidebunt. Praeterea, si id agi ut edatur liber meus (vel hic vel quilibet alius) sentiat vel suspicetur D. Des-Cartes, certo scio impediturum esse si potest, quod unum velim mihi credas qui scio. Caeteram cautelam omnem tibi permitto. Nam et prudentiam et voluntatem in me tuam penitus perspectam habeo. Cum spem edendi videris aliquam, fac me quaeso certiorem quam primum potes, ut eam spem, si fieri possit, mecum Montalbanum feram. Illuc iturus sum cum D. Martello, qui et causa mihi eundi maxima est, quanquam accedat altera haec ut perficiendae parti primae meorum Elementorum majore otio vacare possim. Ibimus circa finem mensis proximi, aut aliquanto citius. Vale. Tuus devinctissimus, Thomas Hobbes. Parisiis Maj. 16. 1646.

The second letter replies to one from Sorbière, which appears to have crossed (rather than answered) the first. The shortened title of the book, when it finally came out in 1647, was *Elementa philosophica de Cive*. What Hobbes says of his work up to date upon the *De Corpore* is, otherwise, the thing of most importance in the letter. As to "Opticæ meæ," cp. *Hobbes*, p. 59. The "Johnson" who had promised to send him the physical system of Regius (Le Roi, Descartes' eager follower) is mentioned in Sorbière's letter in an accidental conjunction, which is too odd not to be quoted here: "Quam gratum fecerim viris summis, solideque philosophantibus, *Boswellio*, *Johnsonio*, Bornio," &c.

II. Literis tuis quas a D. Martello proxime accepi magnopere delectatus sum. Fructum enim omnis operae et laboris praeteritae amplissimum fero, quod placeant ea quae scripsi viris illis tantis quos nominasti, et tibi quoque; spem fecisti fore ut edantur. Quod scribis videri Elzevirio, si prodeat liber tanquam pars majoris operis nondum editi, homines illum minus libenter empturos esse, ego idem censeo, quare mutetur titulus, fiatque simpliciter DE CIVE. Caeterum mutationem tituli sequitur necessitas ea loca tollendi, in quibus mentio aliqua fit sectionis praecedentis, quae quidem loca non multa sunt, nec talia quae non possunt tolli facillime, excepto initio capitis primi quod poterit esse huiusmodi: *Naturae humanae facultates ad quatuor genera reduci possunt: vim corpoream, experientiam, rationem, affectum. Ab his sequentis doctrinae initium capientes inquiremus primo loco quid animi habeant homines illis facultatibus praediti, alteri adversus alteros.* Et an. Item initio capitis quinti pro his verbis *Ostensum est sectione praecedenti* substitui haec possunt *Manifestum per se est.* Caeteris locis cum mentio sectionis praecedentis sub parenthesi tantummodo fiat, poterit ea sine hiatu, sine incommodo deleri, et pag. 4 linea 21 et pag. 17 linea 15 et fortasse uno aut alio loco alias. Tollantur ergo eae parentheses, et fiat titulus ut dixi brevis simplexque DE CIVE, sed cavendum est ne superiorum capitum articulorumve citationes deleantur. Itaque nisi ubi vox *sectio* occurrit, nil movendum est.

Quod in Elementorum meorum sectione prima tamdiu versor, partim quidem causa est pigritia; sed maxime quod in sensibus meis explicandis non facile placeo mihimet ipsi. Nam quod in doctrina morali fecisse me spero, id quoque in Philosophia prima, et in Physica facere studeo, ne locus sit relictus contrascriptori. Attamen de ea absolvenda intra annum vertentem, modo vivam et valeam, minime dubito. Itaque ut rei magis vacem, stat secedere rus, praesertim Montalbanum, nostri Cl. Martelli gratiâ. Expectatio amicorum excitat industriam meam aliquantulum, sed tu me blanditiis tuis ad scribendum potenter adigisti atque impulisti. Accedit quoque quod ipse Opticae meae (quam anglice scriptam dedi Marchioni de New Castel) firmitate et robore delectatus, cupiam primo tempore emittere eam latine. D. Iohnsonnius promisit mihi brevi se missurum D. Regii Systema Physicum; ut id fiat quam primum quaeso adjuva. Vidi enim jam quaedam dogmata ejus physica in libro quodam medico, quae mihi valde placuerant. Vir optime, vale. Parisiis Iuni 1° 1646. D. Gassendo salutem tuo nomine dicam cras; aegrotat a febre quae tamen nunc leviuscula est. Mersennus nondum rediit.

The third letter answers more than one from Sorbière, who had conceived no ordinary expectations on learning that Hobbes (towards the end of summer) had been appointed tutor to the Prince of Wales, now come to Paris as a fugitive (cp. *Hobbes*, p. 63). Hobbes, in the important final paragraph, tells how completely and for what reasons his engagement (as mathematical teacher) was devoid of all political significance. The "Epigramma D^{i} Bruno" was a legend composed by an admirer for the portrait that was to be given with the *De Cive.*

III. Clarissime charissimeque Sorberi cum a te ad Martellum nostrum diu nullae literae venissent cogitabam mecum modo typographum rescripsisse, modo folium aliquód libri vel annotationum interiisse. Nam de valetudine tua et tuorum nolui, de conatu tuo non potui, dubitare. Sed quidquid erat impedimenti, cum nescire moleste ferrem, rogavi D. Martellum ut de ea re ad te scriberet. Id quod nunc factum nollem. Accepta enim epistolâ tuâ, tantas tibi gratias debere me sentio ut querelarum poeniteat et pudeat, si tamen ille quicquam questus est, nam rogavi ut quaereret, non ut quereretur.

Literas tuas ad D. Gassendum et P. Mersennum (una cum epigrammate D^{i} Bruno) illis curavi tradendas.

Quod attinet ad folium impressum quod misisti, valde mihi placet et character literarum, et volumen, neque erratum typorum quod alicuius sit momenti, ullum reperio, praeter unum (sed magnum) pag. 14 l. 2 ubi pro *Duritas* ponitur *Claritas*. Dixi conclusionis *Duritatem* praemissarum memoriam expellere: id quod verum est. Contra fuisset si dixissem *Claritatem*. Duae illae voces scripturam habent fere similem; propter quam causam, et quia forte putabat typorum compositor vocem hanc *Duritas* non esse latinam (nam saepius dicitur *Durities*) factum est ut pro *Claritate* accepta sit. Vox *Duritas* latina est et Ciceroniana, cum sermo sit de dictis duris, quamquam de corporibus duris *Durities* potius usurpatur.

Quod scribis te sedem Leydae fixurum, vehementer gaudeo, cum tui causa qui conversabere cum doctissimis viris, tum mei qui amicis meis illic euntibus quo gratum facere possim tua ope habiturus sum. Scripsi nuperrime (ante tamen quam acciperem literas tuas) ad Comitem Devoniae patronum meum cui filius est sex [*sc. annorum?*] et unicus, ad quem instituendum opus est viro. Ex tua, Gassendi Martelli commendatione cognovi esse D. Du Prat. Si ille conditionem merito eius convenientem [*cupiet?*], enitar quantum possum, utriusque causa, ut se Lugduno Londinum transferat.

Quod mihi de praesente loco gratulatus sis, agnosco benevolentiam tuam. Sed cave ne eam rem majoris putes esse quam est. Doceo enim Mathematicam, non Politicam. Nam praeceptis politicis quae habentur in libro qui inprimitur, imbui illum, ipsius aetas nondum sinit, et judicia eorum, quorum consiliis aequum est regi illum, semper prohibebunt. Si quid ego diuturno officio gratiae apud eum collegero, scias me eo usurum omni, non tam ad meas quam ad amicorum meorum commoditates, et ad tuorum quoque si aliquos commendaveris. Sed multum sperare neque humilitas mea neque aetas patitur. Vale Charissime Sorberi, et ama Tuum Th. Hobbes. Dab. S. Germ. Octob. 4. 1646.

In the fourth letter, with continued anxious care for the correct printing of his book, there is again sign of Hobbes's grudge against Descartes: he can no longer hope much of Regius, content to copy that original.

IV. Amice clarissime, accepi iam duo a te epistolas in quarum priore quam acceperam ante dies circiter viginti, folium primum incluseras, atque etiam duas epistolas, alteram ad R. P. Mersennum alteram ad D. Gassendum, quas ambas illis dari curavi diligenter; et statim rescripsi. In posteriore accipio nunc tria simul folia prima cum literis ad DD. Martellum et Prataeum quas ad eos jam transmittam. In superiore mea epistola notavi erratum typorum unum pag. 14 l. 2, nempe *Claritas* pro *Duritas*. In secundo folio noto jam duo alia magni momenti, quaeque sententiam corrumpunt, pag. 48 lineis 19 et 23, nimirum vox *quaerere* lin. 19 et vox *Ergo* linea 23, quae ambae delendae sunt, nam illis stantibus sensus nullus est, deletis optimus est. Nescio quomodo voces illae irrepserint, aut quia periodus longa non satis a typorum compositore comprehendebatur, illi visum est locum sic emendare, aut ego redigendo illum locum ita putavi emendandum esse, cum non esset opus, nam in exemplari impresso Parisiis illae voces non sunt. Video periculum magnum esse ne in aliis quoque locis similiter erretur, cum neque mea scriptura satis distincta sit, neque ego neque tu praesentes simus; sin accidat ut reliquum libri sine magnis mendis impressum fuerit, non gravabor meis impensis paginam illam 48 cum adhaerentibus denuo imprimere. Alioqui corrigenda sunt errata, et ante initium libri in conspectum danda sunt, ut ab ipsis lectoribus corrigi possint.—Expecto iam ut Physica Regii Parisiis venalis fiat; etsi enim de spe mea verba illa (*copie de celuy de M. des Cartes*) aliquantum detriverint, cupio tamen videre quid sit cuius causa librum illum tanta fama antecessit. Agam quantum potero cum D. Gassendo ut quicquid imprimendum habet vobis transmittat, sed agam cum fuero Parisiis, id est, ut opinor circa medium Novembrem; quamquam si in ea re tuis literis non moveatur, minus movebitur sermone meo.

Nil aliud occurrit quod scribam, nisi ut gratias agam tantis officiis tantaque benevolentia dignas; quod est omnino impossibile; crede tamen animum mihi esse gratissimum amantissimumque tui, etsi non sum ita blandus ut ad millesimam partem blanditiarum quae sunt in epistolae tuae fine attingere possim. Jamais homme ne receut si grand compliment que vous m'avez fait; mais je ne le reuoy

point, neantmoins je vous en remercie. Vale. Tuus Thomas Hobbes. St. Germ. Oct. 22. 1646.

The fifth letter refers to the portrait (before mentioned) which Sorbière had got engraved, but which could not be used because the publisher had reduced the size of the volume from the quarto first intended. As for Gassendi, here and elsewhere so often mentioned, if there was one man who was more than Hobbes to Sorbière, it was he.

V. Domine clarissime, amicissime. Accepi heri literas tuas datas pridie Kal. Nov. atque unâ duo folia, in quibus erratum est nullum, praeterquam quae ipse in margine correxisti levia; consentio tibi ne alia mittas donec totus liber impressus sit. De icone incisâ gratias tibi ago, et ne libro praeponatur facile patior. Epistolam tuam ad Prataeum ferendam cras dabo. Martellus noster Montalbani est, scripsit inde ad me semel, exierat Parisiis circa finem Septembris. Do ad eum literas hodie in quibus id quod de illo ad me scripseras, insero. D° Gassendo salutem tuo nomine dixi hodie; in morbum a quo paulo ante convaluerat, rursus ceciderat, nunc autem rursus convalescit. Conveniendi Mersennum et salutem tuam ei impertiendi mihi St. Germanum repetenti tempus non est. Faciam proximo tempore; ab initio Decembris usque ad Festum Paschalis futuri sumus Parisiis. Illic si Prataeum tuum convenire potero, amicitiam cum eo facere conabor. Cura ut valeas. Tui amantissimus, Thomas Hobbes. Parisiis die II.° Novemb. 1646.

Though Sorbière had, in fact, sent off a bound copy of the finished work on 29th Jan., 1647, Hobbes had not received it a month later, and writes as follows about the delay of publication :—

VI. Mi Sorberi dilectissime, quod diutius jam quam meum desiderium atque amicitia tua requirebat scribendi ad te officium praetermiserim, causa est tua epistola ultima qua admonebar ne librum meum amplius foliatim expectarem sed totum simul via aliqua quae videretur tibi commodissima. Illud igitur de hebdomade in hebdomadem expectans nolui crebris literis videri flagitare, quod sciebam te quam primum fieri posset sponte facturum. Nunc cum tres menses elapsi sunt ex quo impressio libelli tantuli finiri poterat, cumque amicus tuus Dns Musart, operam suam in mittendis ad te his literis ultro mihi obtulit, praetereunda commoditas ea non videbatur. Itaque te oro ut si quid impressioni oblatum impedimentum sit, certiorem me facias. Tuorum denique erga me officiorum cumulo hoc addas ut rescribas, tum ut quando liber ille expectandus sit, tum quod me amare non desisti certo sciam. Mersennus et Gassendus te salutant beneque valent. Te bene valere et cupio et spero. Tui amantissimus, Thomas Hobbes. Parisiis Feb. 28. 1647.

Ad Martellum nostrum scripsi saepius, nihil rescribit, neque ubi sit neque an sit scio.

Next comes the letter (not before published) of greatest interest. Sorbière had written in March, telling of the copy sent in January and of twenty unbound copies to follow as soon as possible by Elzevir consignment; meanwhile enclosing the first sheet, title-page and a portrait "minus bene expressam" (brought down, apparently, to the reduced size of the book), and promising with the later copies some complimentary verses "Brunonis nostri" (who had written the legend for the original portrait); at the same time urging him to let the publisher have his other works, since so many copies of the *De Cive* had already been disposed of. Hobbes's reply is in many ways remarkable. Finding himself designated (by the tuft-hunting Sorbière) on the portrait as "Serenissimo Principi Walliae a studiis praepositus," he makes, in nervous fear of the possible consequences, all the eager suggestions for undoing of the error with which the letter is filled. New light is thrown upon his relations with the prince and the royalist refugees; but most curious of all is the disclosure of his thought thus early of return to England—more than two years earlier than the previous evidence (cp. *Hobbes*, p. 65) gave any notion of, and more than four years before the return actually came to pass. It now looks as if he might have been thinking of possible return from the time that his patron, the young Earl of Devonshire, had gone back and submitted himself to the revolutionary government in the previous year (perhaps end of 1645). The point is of no little significance, in connexion with the charges made against him on the publication of *Leviathan* in 1651 and his flight from Paris to London which then ensued. The reference to Mersenne at the end of the letter gives Dr. Tönnies occasion to bring forward, from the outlying (but related) correspondence, the interesting fact that Mersenne himself and Gassendi resented, as Catholics, the publication of their laudatory letters with the *De Cive*, when they had written them only for the publisher. Having acted in the teeth of Mersenne's previously expressed wish, Sorbière had afterwards to make what apology he could. In the letters between Sorbière and Mersenne, there are obvious errors of transcription which Dr. Tönnies does much to clear up. I have little doubt, as he also in the end thinks most likely, that Sorbière is wrongly represented (in transcript) as having got the two letters withdrawn from the edition: they stand in my, as they stand in his, copy of 1647. On the other hand, Hobbes's urgent wish for excision of the portrait must have been gratified, for none is given, while the figured title-page bears the simple 'Auctore, Thom. Hobbes, Malmesburiensi'.

VII. Eruditissimo viro D. Samueli Sorberio Amico sincero suo Thomas Hobbes.

Literas tuas, vir clarissime, datas Lugduni Batavorum 4° Nonis Martii, accepi traditas mihi a Mersenno una cum primo folio in quo est imago mea. Quam quidem certo scio a te optima in me voluntate libro praefixam. Veruntamen ita se res habet, temporaque ejusmodi sunt, ut magno emptum vellem ut vel praefixa non esset, vel saltem subscriptio illa Serenissimo Principi Walliae a studiis praepositus sublata exculpta vel abscissa esset. Primo enim, id quod est maximum, qui hodie rerum Angliae potiuntur, causas omnes quibus Stirpem Regiam in invidiam apud plurimos conjiciant undiquaque sedulo conquirunt atque arripiunt. Cum ergo viderint doctrinae civili adeo ab opinionibus fere omnium hominum abhorrenti praeferri nomen ejus, jactabunt se inimici magnifice, et etiam odiose, in eo quod quale Imperii jus expectat arrogaturusque sibi sit, jam nunc videtur praemonstrare. Quare quicquid inde mali eveniat, vel evenire

posse praetendi potuit ab illis qui in Aula Principis omne peccatum meum interpretationibus et scholiis suis inflammare parati sunt, id omne cum meo summo dedecore ineptiae et vanae gloriae meae imputabitur. Secundo hoc titulo reditus meus in patriam, si me quando redeundi voluntas ceperit, praeclusus est, nec cur redire non velim si liceat quomodocunque pacatâ Angliâ non video; non sum enim Praeceptor Principis Walliae, nec omnino domesticus (quae causa tertia est quare nollem titulum illum subscribi) sed qualis quilibet eorum qui docent in mensem. Itaque mentitum me esse dicent prae ambitione qui mihi male volunt; sunt ii non pauci. Doleo ergo tot exemplaria jam emissa divenditaque esse. Sed quia id corrigi non potest, demus quaeso operam ut ab iis exemplaribus quae apud Elzevirios reliqua sunt, effigies vel inscriptio, mallem utraque, quamprimum tollatur idque priusquam ulla in Angliam transmittantur. Hoc ab Elzeviriis vel prece vel pretio impetrandum est, pretio si videbitur liber minoris venalem fore sublata imagine vel inscriptione, quod non credo, sed tamen pretio si necesse est. Agam interea hic cum Petito bibliopola ut eam tollat ex suis si quae habuerit (nondum enim allati sunt 21 illi libri quos scribis esse in sarcinis Elzevirianis, neque venit ille cui tradideras librum compactum), et scribam ad bibliopolam quendam Londinensem amicum meum, ut idem fieri curet, si quae istic exemplaria venalia esse contigerit. D. Brunonis benevolentiam gratissime amplector, neque in votis quicquam magis habeo quam ut officio meo officia ejus mereri possim; tamen hoc tempore nullos versus libro praeponi volo quos non ante viderim, tum ne, quod animo et ingenio factum est bono, temporibus fiat mihi non bonum, tum etiam ne aviditas gloriae illius in testimonium ducatur, tanquam etiam indebitum illum titulum cupiverim Praeceptoris Principis. Non est in toto hoc negotio quod meâ culpâ admissum est cui status rerum nostrarum minime cognitus erat. Est quod a te corrigi possit, et propterea quod te oro obsecroque, nimirum id quod dixi ante, ut quamprimum hanc acceperis epistolam, Elzevirium Lugdunensem convenire velis, atque impetrare primum ab eo ut ex illis quae ipse habet exemplaribus effigiem tollat, deinde per eum ut frater ejus qui est Amstelodami, idem faciat, vel si quo alio modo desiderium meum hac in re adimplere possis ut id facere velis. Molesta est haec epistola propter materiam, non faciam ergo ut molesta quoque sit prolixitate. Nihil addo nisi ut valeas, meque adhuc, ac nunc quum maxime opus est, ames. Tui amantissimus Thomas Hobbes. Parisiis 22 Martii 1647. Mersennus et omnes amici nostri permagni dicunt interesse et mei et Principis Walliae ut inscriptio vel potius tota effigies tollatur. Si ut fiat opus sit pecunia non nimis magna, solvam libenter. Iterumque vale.

The eighth letter gives particulars of the illness that nearly carried Hobbes off in the autumn of 1647. The edition of the *De Cive* had gone off in a very few months, and Elzevir was now pressing for another. As to other work with which Hobbes was occupied, and which he had apparently been too much excited about the unlucky inscription of the portrait to refer to in letter 7th, it is to be noted that he speaks in the 8th, and, eighteen months later, in letter 9th, of the *De Corpore* only. There is no word anywhere of *Leviathan*, which, from 1646, was uppermost with him till 1651.

VIII. Eruditissimo praestantissimoque viro Samueli Sorberio Thomas Hobbes S. P. D.

Literas tuas datas quarto die Octobris accepi hebdomade proxime superiore. In qua quoniam libri mei editionem alteram Elzevirium cogitare scribis, ecce mitto tibi inclusum in hac epistola folium in quo quid mutatum esse vellem annotavi. Nihil autem in eo folio continetur praeter errata quaedam prioris impressionis, non enim habeo quicquam quod addam aut demam. Aliam partem Philosophiae Elementorum nondum paratam ullam habeo; nam circa medium mensem Augusti in febrem incidi gravissimam et continuam, ita ut non modo corpore aeger, sed etiam mente laesus, neque amicos qui me visebant, lecto astantes recognoscere potui. Febris ea in lecto me detinuit per hebdomadas sex, postea abiens erupit in apostemata quae hebdomadas quatuor alteras lecto me affixerant, postremo sanatis apostematibus supervenit ischiadica eaque maximis cum doloribus. Nunc autem aliquanto me tractat mitius, sinitque ut animum ad amicorum res convertam aliquando. Per tempora morbi priora accepi a te epistolam unam in qua involuta erat altera ad D. du Prat quam (ubi coepi paulum a febri et delirio respirare) dedi cuidam ex amicis meis Parisiis ferendam dandamque tabellario publico. Nisi morbus intervenisset, perfecissem, credo, partem philosophiae primam quae est de Corpore; ut autem nunc se res habet, eam partem circa festum Penticostes expectare poteris; nihil est quo amplius te detineam, cum valetudine, et perge me amare. Datum Germani 27 Novembr. 1647.

IX. Duplici gaudio me affecit (ornatissime Sorberi) amicus tuus dominus Guatelier, qui et te salvum esse nuntiavit, et mihi a te salutem dixit. Ego tibi rescribo imprimis vota mea, ut bene valere laetus vivere et mihi bene velle perseveres; deinde, si tanti est, curas meas, id est studia philosophica quae tu aliique amici mei et voce flagitant et silentio interdum videntur flagitare.

Quantum cura valetudinis, et erga amicos quos hic habeo praesentes officiorum meorum ratio, sinit, tantum operae scriptioni impertio, scriptioni inquam, non enim iam quaerendae sed explicandae demonstrandaeque veritatis labor editionem moratur. Puderet me tantae tarditatis nisi certus essem rationem ejus in ipso opere satis constitutam esse. Veruntamen non ita longe abesse videor a fine primae partis (quae et maxima est et speculationis quam ceterae partis profundioris), ut non possim (Deo favente) eo pervenire ante exactam hanc aestatem. Interea tabulis aeneis figuras quibus utor in demonstrationibus meis, quotidie incidi curo, ut simulac scribere desierim, omnia praelo parata sint. Accipio quandoque literas ab amico nostro Domino Martello, et accepi nuper; degit plerumque, credo, Buldigalae. Bene valet et me amat. Tu quoque vale (optime Sorberi) et me ama. Tui amantissimus, Thomas Hobbes. Parisiis Junio 14. 1649.

Leaving aside the remaining eight letters (from 1656) as unimportant, it should be added, with reference to Dr. Tönnies's interesting discussion of the circumstances and motives of Hobbes's return in 1651, that the conjecture he (at a distance) hazards as to the beautiful MS. of *Leviathan* in

the British Museum—*viz.*, that, as being presented to the young king Charles II., it would hardly contain the bold "Review and Conclusion" of the printed work—is not correct. This epilogue, for all its outspoken independence, duly figures at the end of the MS.; and Clarendon, who describes the presentation-copy as "engrossed in vellum in a marvellous fair hand," must be left to settle with himself (and with the others who took the idea from him) how, if Hobbes wrote 'The Review,' &c., in order to curry favour with Cromwell, he could be so rash and so rude as to thrust it into the hands of the exiled prince.

MÜNSTERBERG ON 'MUSCULAR SENSE' AND 'TIME-SENSE'.[1]

THE first of the four researches occupying pt. ii. of Dr. Münsterberg's *Beiträge zur experimentellen Psychologie* (see *Mind*, No. 58, p. 234)[2] is a very good and characteristic specimen of his workmanship. It is concerned with that question of 'Time-Sense'—meaning the comparative measurement of short time-intervals—which has been one of the most constant subjects of psychophysical inquiry for the last five and twenty years, but which, owing to the bewildering variety of the results obtained, cannot thus far be reckoned among the triumphs of the experimental method. Münsterberg carefully reviews all the work that has previously been done upon the subject, from Mach, Höring and Vierordt on to the younger investigators in Wundt's laboratory; embarks next upon a far more searching introspective analysis than had yet been attempted of the conditions and means of time-measurement; and, after gaining thereby some light upon the discrepant and even opposed figures of the other experimental inquirers, brings his own subjective results more or less decisively to the test of positive experiment.

The inquiry bears directly on the general thesis of the *Beiträge*—that all so-called activity of consciousness must admit of resolution into "change of conscious content" if the psychophysical method is to be taken seriously and consistently carried through. It is common to the later time-researches (which have proceeded chiefly from the Leipsic laboratory) to find, with whatever difference of numerical values, a periodicity in the power of more or less accurately estimating the comparative lengths of experimental time-intervals. The only supposition so far advanced to meet the facts has been to credit consciousness with a faculty of directly apprehending such (short) intervals.

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[1] *Mind*, xv. 524.

[2] P. 288, above.

This faculty has been called 'Time-sense,' after Czermak, who in 1858, without himself experimenting, gave the first suggestion of specific inquiry to be made on the subject. It is distinguished by Wundt (*Phys. Psych.*, 3te Aufl., ii. 354) from our common estimation of the lapse of time—allowed, so irregular as it is, to be dependent on the varying flow of representation. Now one result of Münsterberg's inquiry is to break down the distinction which it has thus been sought to make between our rough natural judgment of the length of considerable time-intervals and that delicate appreciation of minute differences which takes place under experimental conditions. In the one case, as in the other, he finds a "content" present; and all depends, in either case, upon what the nature of the content is. Speaking generally, the "content" proves, directly or remotely, to be of that kind which goes most commonly by the name of 'Muscular Sense' (because in some way connected with the physiological process of muscle-innervation). The present occasion requires, therefore, some definition of Münsterberg's position in regard to 'Muscular Sense'; and it is the more necessary that this should not be deferred, because it is one of the most characteristic features of his whole line of inquiry that he shows the muscular factor to be everywhere implicated in the psychophysical theory of mental life. It figures with decisive effect in all the researches he has yet published; being even employed in the latest memoir (filling pt. iii. of the *Beiträge*) to account for the intensive character of sensation generally, and thus giving ground for a daring attempt to refound from the bottom the whole theory of the quantitative relation between sensation and stimulus, to which (since Fechner's time) the name of 'Psychophysic' has mainly been limited.. Upon that attempt, with its underlying theory of intensity, all judgment is reserved; but any remarks now made to clear the way for understanding of the results, as striking as they are novel, obtained in regard to 'Time-sense,' may yet be taken as having also other application, of which more anon.

Münsterberg's doctrine of 'Muscular Sense'—to call this here by its least question-begging appellation—is worked out at length in his prior essay, *Die Willenshandlung* (see *Mind*, xiii. 436), and is only summarily repeated in the *Beiträge*. While not put forward as mediating between the opposed theories that have thus far occupied the ground, it yet may be regarded as helping in that way, and the more deserves consideration on this account. Apparently, he puts himself on the side of those who, of late years, with gathering strength, have contended that all the sense-experience in the case is peripherally determined—that muscle has first to be got into the state of actual contraction and afferent nerve-fibres in muscle itself or related parts (ligament, joint, overlying skin or what not) have to be thereby stimulated at their peripheral ends, with consequent cerebral excitation, before anything that can be called 'sense' arises. In other words, the supposition (as by Bain or Wundt) of a specific subjective experience directly attending the original cerebral outflow of nerve-impulse towards muscle must be rejected. Yet, in fact, nobody could be more decided on the point that, with all muscular action which we are consciously aware of performing, there is other subjective accompaniment than follows upon actual contraction at the periphery. There is always, in such case, a prior state of consciousness involved, a real (subjective) antecedent to the innervation of the muscle or muscles concerned. In other words, Wundt's 'innervation-feeling' (or Bain's 'feeling of muscular exercise,' 'feeling of energy put forth') stands for an indubitable fact of experience. True, it is nothing that can properly be called 'sense,' being, in point of fact, a mere memorial representation (*Erinnerungsbild*) of foregone muscular action now again to be put forth. But, besides being thus inevitable antecedent of the coming contraction, so much and so regularly is it also constant accompaniment throughout the whole course of the muscular act that in pathological circumstances, where this or that element of present sensation (peripherally determined) may have dropt out, it can supply in representative form all that is wanting to the effective conscious account.

If this may be taken as a fair indication of the position taken up by Münsterberg on the question of 'Muscular Sense,' I desire, without now considering how far it may have been before approached by others from the same side, to call attention first to the significance of the concessions it involves. It is allowed that in the muscular (or, as it is commonly called, motor) attitude we are quite otherwise conscious than in any state of mere sensible affection. Whatever elements of (passive) sensation, peripherally determined as in the case of all other passive affection, may be shown to be present in the conscious account when muscle is contracted, there is also never absent another element of experience peculiar to this case and to this case alone. In none of the special senses or the modes of general sensibility does the conscious experience that arises through stimulation of afferent nerve-fibres have as antecedent other conscious experience, which, whether representative or not, means a cerebral excitation already under weigh before the brain is again excited by ingoing stimulus from the periphery. Now Bain at least, with his 'Muscular Sense' proper, has always been concerned to establish nothing so much as just this peculiarity of *attitude* in the system (whether physically or psychically understood) when muscular action is in process; and, for the rest, both he and in his own way Wundt have never overlooked the elements of (passive) sensation inevitably bound up, by constitution of the system, with the process of muscle-innervation. To me, indeed, it has long seemed that, whether regard be had to the elements of 'common sensation' necessarily excited under muscular contraction or to the procurement and variation of special sensations (sight, touch, &c.) effected by exercise of particular muscles (of eye, hand, &c.), the truest description of so-called 'Muscular Sense,' for psychological purposes, will represent it as never other than a co-efficient with this or that kind of passive sense to a resultant in experience that is most aptly termed 'active sense'. Though it may, by experimental artifice, be more or less separated out from the accompaniment of special sensation by which it is normally attended; and though it may even, with greater difficulty, be made to throw off this or that element of common sensation ('organic sensibility') naturally implicated with it; yet in perfect purity, *i.e.*, without *any* concomitant of (passive) sensation—meaning sensation peripherally stimulated—I do not see how it can ever in actual experience be found. This, however, should not remain doubtful, that there is in it, as a kind of conscious experience, something other than and prior to any such sensation.

As to whether this prior element has an altogether representative character or may be claimed as, at least to some extent, presentative—which is a way of expressing what both Bain and Wundt assert by their use of the name 'feeling,' or also 'sensation,' for it—the point is one of great interest, though its determination one way or the other would not affect the main psychological issue. That there must be representation involved, is not to be doubted. The fact that the process of muscular innervation, in the case supposed, sets out from a cortical seat, however constituted or wherever situated this may be, implies that it must be affected by all that has previously gone on in or through that cortical area; and this, in subjective language, means 'representation'. Why, even in the case of peripherally stimulated sensation, where of course the stimulus has first to reach the brain-centre before the sensation comes to pass as conscious experience, it cannot be supposed that this, though denominated 'sensation,' is so altogether presentative in character that it is not, then and there, modified in quality or otherwise by previous excitation of the same centre—in other words, is not overlaid by 'representation'. Let it then be frankly allowed that any particular muscular innervation proceeding from the brain-cortex must have its specific subjective phase—I mean that distinctively prior or initial one now under consideration—inevitably modified by the previous history of the 'centre' concerned. And all those who (like Münsterberg) have learned to regard the physiological distinction of 'motor' and 'sensory' centres as more or less artificial, may well hesitate to say what amount of representation may not be involved in the energising of whatever widespread or deep-going cerebral plexus a particular muscular innervation takes its more immediate start from. But just as there never has been any hesitation in connecting some mode of presentative consciousness, under name of 'sensation,' with cortical excitation determined from the periphery—without reference to the representation necessarily co-involved, and apart from any question of the further course towards the efferent (so-called 'motor') side of the system which an incoming (so-called 'sensory') stimulus always *tends* to pursue; so, when from within (*i.e.*, apart from direct 'sensory' stimulus) a process is started which results in muscular innervation at the periphery, it seems analogically justifiable to posit an element of presentative consciousness in the case—over and above anything in the way of representation not denied to be necessarily implicated. The difference on the afferent side of the system between sensation and representative image is allowed to be one that depends only, or at least mainly, upon degree of excitation; this being (normally) greater when determined from the periphery. How then should there not be a corresponding difference of representative and presentative experience on the efferent side when the cerebral process in one case is not, and in the other is, effective in producing overt muscular contraction? The force of the analogy, such as it is, can be turned aside only by the kind of assumption which, for example, Bastian has made, when he declares the organ of mind to be "that portion only of the nervous system which has to do with the reception, the transmission, and with the vastly multiplied co-ordination of 'ingoing currents' in all kinds of nerve-centres" (cp. *Mind*, vi. 128). But with an organic whole like the nervous system, nothing could well be more perilous than such division.

The reference just made to Dr. Bastian, who among English inquirers led the way and has maintained the lead as advocate of what may be called the passive-sense theory of 'Muscular Sense,' suggests another. A point that remains to be noted in Münsterberg's treatment (or expression) is common to him with his English predecessor. Some ten years ago, in a review of *The Brain as an Organ of Mind*, it was observed[1] that to speak, with Bastian, of 'Muscular Sense' as 'Sense of Movement' ('Kinæsthesis') did not mark a step forward in psychological discernment. Bastian, to be sure, was not singular in adopting that mode of expression, for it had been used by Bain and others before as a convenient synonym. It has also since that time been pretty freely employed, apparently without heed to any difference of implication. Thus Münsterberg, who generally uses the name *Spannungsempfindung* or 'sensation of strain' (cp. Bain's 'dead strain') for the whole aggregate of conscious experience representative and presentative, attending the muscular act, does not hesitate to give often as simple alternative *Bewegungsempfindung* or 'sensation of movement'. A little reflexion, I venture still to think, should suffice to rule it out as either alternative or substitute. 'Movement,' as such, is, no doubt, a notion of prime importance in psychological explanation, and much that appears simple to ordinary consciousness finds expression in terms of more or less complex motor representation; but, however potent an instrument of psychological reduction, movement cannot be held a simple datum of conscious experience except with those to whom space and time appear to be such data. Granted an original intuition of space and time, and there need then be no difficulty in assuming a sense —or, rather, intuition—of movement, importing with it the relative apprehensions of time and space within which movement has to proceed. But, if it is recognised that one of the psychologist's first and chief tasks is to give genetic account of our space- and time-apprehension (let the data employed for this be what they may), how can 'movement' help following suit? To Münsterberg at least, it is not doubtful that space-perception is a synthesis of touch, sight, &c., with 'muscle-sensation' (as sometimes, *e.g.*, pt. ii. 25, he does not fail to call it). I would urge then, not that 'muscle-sensation' be never called anything else, but that those who rely upon it as indispensable (original) factor in the psychological account of space-apprehension should never call it by the name of 'sensation of movement'. They cannot do so without laying themselves open to the charge of having already virtually assumed space (and time) as simple original intuitions and thus of solemnly playing out the farce of ὕστερον πρότερον. 'Movement,' in short, from the psychogenetic point of view, is a complex perception, as ill-fitted as possible to be the designation (subjectively meant) of an original sense-experience. It is not 'movement' that we are originally conscious of in the case of muscle-contraction—were it only because, in point of fact, movement is by no means always the result of getting into the muscular attitude. Moreover, when movement does result, it is movement of limb, head, &c., that in fact takes place and that we are conscious of,—not movement of muscle (as in a loose way, with more or less of physiological reflexion, we come to say). Now, surely, movement of limb or the like is, subjectively regarded, most complex perception. Thus, on every ground, 'movement' is to be deprecated as subjective designation of the simple sense-experience. For this we must rather fall back upon and adhere to such words as 'tension,' 'strain' or 'effort,' which—though they too (like most other, if not all, psychological terms) are not without an objective meaning and application—can consistently be used with an import at once subjective and simple. To 'muscle-sensation,' on the other hand, no exception can be taken, provided it is meant for no more than mere external designation as when we speak of 'eye-sensation,' 'skin-sensation,' or the like.

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[1] *Mind*, vi. 127. See below.

Turning now to the special question of 'Time-sense,' it is impossible for any one to read such an account as Wundt gives (*Phys. Psych.*, ii. 348-59) of the experimental results hitherto obtained and not to be struck most of all by their extreme discrepancy. The time certainly had come for asking what it might be that was rendering so futile all that expenditure of scientific skill and patience. Prof. Cattell, when giving in *Mind*, a year or two ago, some general account of the psychological work that had been done in the Leipsic laboratory, made in regard to the time-experiments a suggestion as to unavoidable error in the method adopted; but this applied rather to the discrepant results obtained by one and the same inquirer than to the more signal differences separating every inquirer from all the rest. The fault, evidently, must lie deeper; not to say that the various experimenters have themselves, in general, shown no want of ability or readiness to note and allow for shortcomings in mere method. Experiment, where applicable, is a very powerful instrument, but, if it is to perform its decisive work, there must first have been a close intellectual analysis of circumstances and general conditions, and the end to which it is to be directed must be well and clearly conceived. In the present case, it is mostly at the prior stage of pure psychological consideration that the fault has lain; or rather, it is want of prior psychological analysis that has rendered so abortive all that experimental labour.

Here in paraphrase, with some expansion, is Münsterberg's final summary (p. 13) of the outcome of his predecessors' work. The 'constant error,' which most of the inquirers have noted in our comparison of small times, is according to one the result of accidental circumstances, but according to others takes the form of regular over- or under-estimation: one maintaining that times under 3 sec. are magnified and above 3 sec. are shortened; another putting the dividing point at ·75 sec.; and a third declaring that not only the times under ·75 sec. but also the comparatively larger times over 5 sec. are magnified. When there is under-estimation, this, according to one, attains a minimum, *i.e.*, departs least from the true value, at all multiples of ·7 sec. (or thereby); according to another, only at all odd multiples of this figure (2·1, 3·5 sec.), the even multiples on the other hand yielding maximum-values[1]; while, according to a third, the reckoning is least inexact at multiples of 1·25 sec. As for Weber's law, it either, according to one, has no application to 'Time-sense'; or has absolute application, according to another; or, according to a third, holds for the smaller but not for greater intervals; or finally, according to a fourth, holds for the greater but not for the smaller. In this summary record, no account is taken of Mr. L. T. Stevens, who in *Mind*, xi. 393 got, as main result of a very protracted series of experiments, a complete reversal of that sign-value of the 'constant error' upon which, amid all their other differences, the German experimenters have agreed more or less; Stevens finding the smaller times (under ·53 sec.) to be under-estimated, and the larger (over ·87 sec.) to be constantly over-estimated!

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[1] In his summary statement (pp. 13, 14), Münsterberg has here, by oversight, put "maximum" for "minimum" and "minimum" for "maximum".

Bad as things are with the 'Time-sense,' they are not quite so bad as this direct contradiction would make them appear. Stevens's method of experiment, as Münsterberg points out, is too disparate from that of all the others to afford any grounds for comparison of results.

Taking, then, the German results, in all their variety, by themselves, Münsterberg proceeds to ask whether it can be otherwise than that the different inquirers have unawares brought quite different measures to the estimation of those small times; and this suggests the central question of all, what it really is that they have set out to measure in the case. A small time-interval being marked off by two limiting sounds, the problem, in general, has been for the experimenter—starting at once from the second sound, or waiting till after a pause (commonly taken of the same length as the given time) and then starting from a third sound—to indicate by some kind of action when he judges that an equal time has elapsed as between the first two sounds. The particular means by which this is effected for such very short intervals as can with some approach to accuracy be thus determined are detailed at length by Wundt (*Phys. Psych.*, ii.), who has done more than any other to devise them; they are also sufficiently explained by Münsterberg, who, while vindicating them from some objections that have been charged, is able also to improve upon them for his own use. Without attempting any description of them here, the point to be noted is, that the 'comparison-time' sought has to be subjectively determined, being sensibly limited only at the beginning, whereas the given or 'normal' time is objectively (sensibly) determined at both ends. Now the assumption hitherto has been that the two limiting sounds form the whole sense-content of the 'normal time,' and that the apprehension of time-interval between them must be set down as a direct act of consciousness, which can be repeated with more or less exactness under the different conditions of the 'comparison-time'. The directness or simplicity of the conscious function in both cases has procured it the name of 'Time-sense,' but, in reality, all that is strictly sensible in either case are the limiting sounds. It is here that Münsterberg takes issue.

Careful introspective scrutiny of his own time-estimates under the experimental conditions discloses for him a whole class of factors overlooked, or hardly regarded, by previous inquirers. These are sensations (or representations) of muscular tension, and when looked at closely enough are found to be of the most varied kind. As to this presently; but first a word on the question of principle. How without some definite means should there be estimation of time at all between two sound-sensations? Two pairs of similar sounds, separated now by one now by another interval of time, are to consciousness the same fact of sense-experience except in so far as something else is present to differentiate the pairs in respect of time-interval. Let this something be (as it may be) called act of attention, since without special attention to the time-intervals as such the experience in each of the cases supposed would simply be of the sounds as two. But then the attending, which makes or marks the difference of time-interval, must consist of something—something different in the two cases; and what may this be but certain feelings of muscular strain (actual or represented), if the feelings are evidently there and the closest observation can detect nothing else? Sense of muscular strain, though by itself, of course, it is not consciousness of time, may yet be so much the main factor in such consciousness as to mark (in its variations) the difference between this time-interval and that. Without arguing the matter at length, Münsterberg here takes up the position that as space-apprehension can be shown to arise through fusion or synthesis of elements of sensation (chiefly touch and sight) with felt muscular activity, so also time-apprehension is explicable as another synthesis of feelings of muscular tension with sense-elements (by preference sounds). No doubt, the question even as regards space remains under debate; but at least from those who under Wundt's lead have done most of the experimental work on 'Time-sense' no objection in principle can come to the extension of such psychogenetic consideration to time. All depends however, for the one or the other problem, upon the precise nature of the muscular experience to which the (passive) sensations, so differently present in space- and in time-perception, give occasion. Hence, for the more special question of the means of comparative time-measurement now in hand, the need of making up the account with all that particularity that distinguishes Münsterberg's novel introspective effort.

His experience is in many ways far from uniform, but, except with very short intervals (put for himself under ⅓ sec.) where nothing can be noted, the central fact is for him always a felt process of varying muscular strain. The experiment, let it be remembered, consists in the attentive hearing of a first sound, with a second expected presently; upon the hearing of which—in the simpler case where no pause intervenes (to be closed by a third sound)—the subjective estimate of 'comparison-time' has to go forward without other condition supplied There is actual strain in the hearing of the first sound; and this being taken, in the circumstances, as signal of another sound to follow, there is next representation of strain in expectancy of the second sound, with actual strain again when this comes to be heard; whereupon representation must do all the rest. Now what Münsterberg finds is, that the varying strain, actual or represented, fills up and is all there is to fill up his consciousness in connexion with the limiting sounds. The sounds themselves have no appreciable after-images and thus are no more than limits. As for the muscular tension, it appears to him to vary in the way of waning from the initial height to zero and of then waxing (in representation). But he observes that this twofold process, when occupying the foreground of consciousness, appears to undergo a certain retardation—with the obvious result of enabling it (in the experimental case) to fill up somewhat longer intervals than it else, naturally, would. For the rest, when the interval is not too great to be within the compass of any possible drawing-out of the whole process, he finds that now one now another combination of the two stages (of waning and waxing) may be employed to span it. All that is necessary is, that whatever combination served to fill up the given 'normal time' be reproduced (in imagination) as exactly as may be for the 'comparison-time' that has to be equated.

So far the general scheme; but, to understand how the strains can have their waning and waxing thus variously combined, note must be taken of the precise muscular acts involved. While it is matter of common experience how directly sounds, beyond all other sensations, pass over into movement of limbs, it is rather in action of head, neck and shoulders, with related parts, that the attentive attitude of listening consists, joined, of course, with tension of the muscles inside the ear itself. But, in watching himself when on the strain to get a measure of time-interval, Münsterberg is most of all struck with the part played by the great periodic function of breathing. So massive as this is in its alternating rhythm of inspiration and expiration, he finds it cannot proceed in either phase without modifying the state of tension in which the connected muscular parts happen to be. If the strain of attentive hearing is in process of being relaxed, the waning is helped by expiration; on the other hand, the gathering tension of expectancy comes to a head the more readily as the breath is drawn in. The effect of either kind, he gives reason for supposing, is wrought through the special nerve-centre of respiration; but, however this may be, the breath-rhythm is, in his experience, so dominant a factor in all attempts at experimental estimation of time that the fact of its having been overlooked by previous investigators is, for him, enough to render all their results of no account. If it so inevitably and powerfully affects the varying strain of the attentive attitude, the very first thing to be considered would seem to be the precise stage of the breathing-process from which the experimental reckoning begins to be made. But its part in the work of time-estimation does not stop there. In the case of relatively longer intervals—that is to say, such as are beyond the span, however drawn out, of the twofold process of waning and waxing tension directly involved in the listening attitude—the breathing-rhythm may itself become the chief, if not the only, means of time-measurement. In that case, Münsterberg finds it subject to a variety of modifications. First, the respiratory act appears to him, like other muscular tensions, to get drawn out when consciously attended to; thus acquiring more span or measuring-power within the single period. Then, while normally there is a pause between the end of expiration and the beginning of inspiration (amounting to about a third of the whole breathing-period), he observes that this is apt, in the experimental attitude, to drop out; with the result that the function, become thus continuous, gains increased efficiency for measurement. Again, he notes himself as at times actively forcing both inspiration and expiration (the latter of which, in normal circumstances, is left to simple elasticity of lung), thus making several short respirations within the regular period of one; the accommodation being obviously directed to the procurement of uniformity of breathing-phase between the two time-intervals. And, once more, in the case of such times as surpass the possible duration of the most protracted single act of respiration, he remarks the tendency to keep up a certain convenient rhythm of breathing, which, though it never passes into the form of numerical calculation, gives the most effective means of comparative estimate.

After such careful reckoning with his experience under the special conditions, Münsterberg proceeds to argue that the variety of our common judgments of the lapse of time depends, no less than in the experimental case, upon the degree to which expectant strain (ultimately muscular) is present with the impressions of any kind that are being received; and, again, that the facts of time-memory, even when this illusorily reverses the original judgment, in no way conflict with the view he has obtained of the actual factors involved in time-measurement. Next, by close examination of what is expressed or implied in the records of previous experiments, he is led to the conclusion that the true reason of the marked discrepancy of numerical results is to be sought in their authors' disregard of the precise factors involved, more especially the all-dominating breath-rhythm. If the periodicity of some kind noted by all the Leipsic experimenters in their time-estimation points to the implication of such a periodic factor as the respiratory function, then obviously the (overlooked) differences of breathing-phase in which by constitutional habit or by chance they made their estimates may well account for their discrepant figures. Both arguments—too pertinent to the matter in hand to be fairly called digressions—are very acutely, and more than plausibly, worked out by Münsterberg.

But, attention having been thus drawn to one of the most interesting parts of his whole memoir (pp. 43-54), it is of more urgency here not to omit following him into the concluding section (pp. 54-68) where the results of his subjective analysis are brought to the test of experiment.

It is but a small part of the whole mass of time-experiments he has made that Münsterberg cares to give even the most summary account of. Following in general the Leipsic manner of experiment at its highest development, but improving upon it by reduction of the amount of motor reaction called for in the estimator (an important matter in such delicate work), and by having the 'comparison-time' closed as well as begun, like the 'normal time,' with sound of hammer-stroke (thus equalising the conditions of expectancy as never before), he made a very large number of trials with another person as estimator, on the line of the earlier experiments, going up from 1 to 5 sec. intervals, by ¼ sec. steps. All these he leaves aside, as of no more real value than the Leipsic results; any periodic law that could be got out of the figures having no validity so long as the determining factors in the estimator's consciousness are not accurately assigned. He gives instead, in compendious form, only the results of some other series of experiments with himself as estimator; an assistant being employed to fix the intervals for which equation was sought. These were advisedly taken of a length, from 6 to 60 sec., such that the subjective conditions could be marked with some certainty.

In the first series, the 'comparison-time' was estimated without pause on completion of the 'normal time' propounded, but under these different circumstances. (1) It was left to the assistant to propound intervals in pell-mell order (*e.g.*, 15, 7, 22, 18, 24 . . . sec.) without reference to Münsterberg's breathing, who in turn made his comparative estimate without altering in any way the regularity of its natural rhythm. (2) The assistant was required to keep close watch and propound only such intervals (though again in pell-mell order and without too violent contrasts, *e.g.*, 11·5, 14, 7·2, 16·4, 21·6 . . . sec.) as should make Münsterberg begin his estimate at precisely the same stage of the whole breathing-process as he was in at beginning of the given 'normal time'.

No 'constant error' (*i.e.*, of over-estimation or under-e mation) appearing after many trials, all the errors, in p centage relatively to the 'normal time,' were put togeth for (1) and (2) separately; and, then calculating out the me error, Munsterberg found this to be as much as 107 p cent. for (1) and as little as 29 for (2). A very mark difference, truly.

In a second double set of experiments, the same differen of circumstances was repeated, except that the estimate wa now to be made after a pause varying from 1 to [illegible] se that is to say, instead of using the second stroke, which closed the 'normal time,' as initial limit of the 'comparative time,' this was given by a third stroke. Here (1), where n regard was had to breathing-rhythm, the mean error [illegible] from 107 to 24 per cent.; but (2), where care was taken have the comparative estimate begun, as far as possible, the same respiratory stage with the 'normal time,' the mea error rose from 29 only to [illegible] per cent. A [illegible] remarkable result.

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No 'constant error' (*i.e.*, of over-estimation or under-estimation) appearing after many trials, all the errors, in percentage relatively to the 'normal time,' were put together for (1) and (2) separately; and, then calculating out the mean error, Münsterberg found this to be as much as 10·7 per cent. for (1) and as little as 2·9 for (2). A very marked difference, truly.

In a second double set of experiments, the same difference of circumstances was repeated, except that the estimate had now to be made after a pause varying from 1 to 60 sec.; that is to say, instead of using the second stroke, which closed the 'normal time,' as initial limit of the 'comparison-time,' this was given by a third stroke. Here (1), where no regard was had to breathing-rhythm, the mean error rose (from 10·7) to 24 per cent.; but (2), where care was taken to have the comparative estimate begun, as far as possible, at the same respiratory stage with the 'normal time,' the mean error rose (from 2·9) only to 5·3 per cent. A not less remarkable result.

In face of these figures, if they are even approximately confirmed by other experimenters, it seems impossible to doubt that breathing has a prerogative position among the sense-factors concerned in the estimation of short time-intervals; and it is much to be hoped that the whole subject will be taken up again, at Leipsic or elsewhere, with express reference to Münsterberg's path-breaking analysis or at least not without similar attempt at prior determination of the precise content of the time-experience which it is sought to measure. But, in itself, breathing is of course only one among other muscular factors involved, and the general outcome of the novel research, so far as yet carried, is to bring impressively into view the import of muscular activity for psychological explanation. A subsidiary series of experiments, too slightly indicated, goes some way to supplying the confirmation that comes by negative instance. Münsterberg tried time-comparison by means of a set of voluntary tensions and relaxations (not said what) slowly carried out so as to be independent of the breathing-rhythm; and here the estimate was still good and sure. But when he proceeded to estimate for intervals between 3 and 10 sec. without regard to (felt) tensions of any kind, not all his foregone practice in time-comparison was of any avail to save him from such arbitrary 'shots' as taking 12 sec. to be equal to 4 or, again, 3 to 9. If the facts were so, their significance seems greater than Münsterberg cares to claim against the possible objection that among the subjective data disregarded may have been the very 'Time-sense' whose existence is in question. The objection cannot well be urged, since the supposed 'Time-sense,' taken to be a direct activity of pure consciousness, cannot properly be expressed in terms of the (felt muscular tensions and relaxations of the experiment.

What Münsterberg may in any case be fairly credited with having accomplished, is to bring the conscious activity of time-estimation into relation, hardly before suspected, with a definite basis of sense-experience. The name 'Time-sense' thus has more justification than it ever got from its inventors, for whom it has marked only the apparent immediacy of time-apprehension. But yet, as we do not properly speak of a 'Space-sense' except to indicate that there are sensory elements necessarily involved in all space-apprehension, so should it be also with 'Time-sense,' whenever the psychological account is finally made up of which he has here done a good deal more than give the first sketch. The memoir, as a whole, seems to me at once so interesting and important that I have preferred to use the available space for a somewhat full summary of it, rather than for critical remark. Question might be raised at a good many points. For example, it is not clear how the author can psychophysically interpret the act (on which he lays stress) of attending to the waning and waxing of the muscular tensions which are for him the means of attending to the limiting sounds of the experiment. But whatever other difficulties might be noted in the research, whether of principle or detail, they leave untouched its character of rare suggestiveness.

LEIBNIZ AND SPINOZA.[1]

In a volume recently published under the above title[2] the editor of the *Archiv für Geschichte der Philosophie* has brought his great erudition, as well as philosophic insight, to bear upon a long and much-debated question, and has succeeded in giving to it at last something like a definitive solution. What did Leibniz, who stood forth in the end as the only possible victor of Spinoza, himself owe to the decried Jewish thinker? The question has the more interest because, while Leibniz through all his later years helped not a little to swell the general chorus of reprobation, his own monadology has yet seemed to many to work out into a pantheism as decided as Spinoza's. Be this as it may, Prof. Stein has seen the need, and also the opportunity, of taking up the question anew, in a fashion not possible before. Gerhardt's collected edition of Leibniz's philosophical works, which has been in progress since 1875,[3] affords for the first time the means of tracking, with an approach to continuity, the all-inquiring man throughout the devious course of his mental development. Where Gerhardt comes short in completeness, or sometimes correctness of chronological presentation, his untiring labours have yet rendered it comparatively easy for others, like Prof. Stein in the present volume, to supply the deficiency by independent search in the Leibniz archives at Hanover. The new task, then, was to take all the discoverable facts of personal relation between Leibniz and Spinoza, and interpret them in the light of what can now be more exactly made out as to Leibniz's intellectual history earlier and later. It was first essayed by Prof. Stein in a Berlin Academy memoir of 1888, and is now achieved with a circumspection and thoroughness that leave hardly anything to be desired. The result is, that we have not only a settlement, which may be taken as practically final, of the Spinoza-question, but also a more coherent and satisfactory view of the development of Leibniz's monadological thought than had yet been furnished of that difficult problem—for all the labour and ingenuity that have been so long bestowed upon it.

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[1] *Mind*, xvi. 443.

[2] *Leibniz u. Spinoza.* Ein Beitrag zur Entwicklungsgeschichte der Leibnizischen Philosophie. Von Prof. Dr. Ludwig Stein. Mit neunzehn Ineditis aus dem Nachlass von Leibniz. Berlin: G. Reimer, 1890. Pp. xvii., 362. (See *Mind*, No. 62, p. 298.)

[3] Completed last year with a supplementary (seventh) volume. This includes, with a large variety of new matter, pieces which were noted in *Mind*, xiii. 312 (see above, "Leibniz and Hobbes") as absent from the six volumes to which the edition was originally to be confined. Unfortunately, Gerhardt has not supplied the General Index which would have so greatly enhanced the value of his devoted labours. And, apart from Index, a little more practical sense in the matter of headings to pages, &c., would have made reference to the handsome volumes far easier than, to one's sad experience, it now is.

It has now for some time back been generally recognised that Leibniz (b. 1646), though already committed to the philosophic life in his teens, had reached his fiftieth year before he was known publicly to have worked out a new metaphysical doctrine of his own. The publication was by way of two short memoirs in 1695—the *Specimen Dynamicum*, of more specially scientific import, and the better-known philosophical essay, *Système nouveau de la Nature*. Even then he had not lit upon his distinctive watchword of 'Pre-established Harmony' (in that precise form), to express the universal intercommunion of substances; the phrase occurring to him only some months later in the course of sequent controversy. Nor did he adopt his no less distinctive 'Monad,' to express the individuality of each and every substance, till the following year; borrowing it most probably, as Prof. Stein now gives new ground for supposing, from the younger v. Helmont. But the more important and interesting question is, when he had first attained the essential points of his new doctrine of substance. Now as to this it can, with Prof. Stein, hardly be doubted any more that it was by the year 1686, when he wrote the untitled essay (Gerhardt, iv. 427-63, first published by Grotefend in 1846) which he himself speaks of as "un petit discours de metaphysique" in sending at that time an abstract of it to Arnauld (Gerhardt, ii. 11-13). Much lay here undeveloped, which only gradually dawned on him in the course of the correspondence with Arnauld that followed (till 1690). But the central conception of a system of individualised substances is already there; whereas of this there is no trace in the next-earlier writing, published in 1684, the well-known *Meditationes de Cognitione, Veritate et Ideis.* It is surprising that this epistemological tract, in which Leibniz, pursuing his long polemic with Descartes, sought to give much-needed precision to the Cartesian criterion of truth, should ever have been regarded as giving the first indication of his own new doctrine of substance. But, in this default, how are we then to construe the actual course of his mental history up to 1686, the date from which onwards the progressive development of his monadological theory, in all its articulation, can now be accurately traced? Here it is—for the years before 1686—that Prof. Stein succeeds in bringing clearly into view a series of determining factors hardly suspected, or at least not at all definitely enough conceived, before; and these factors all have relation to a demonstrable influence, deep as well as prolonged, from Spinoza.

The main positions are these:—that, after a youth of general philosophical interest and varied aspirations, followed by a time (from 1672) of fruitful mathematical study and discovery, Leibniz was brought, by serious occupation with Descartes towards 1675, to such a state of mind that he was fain to turn for help to Spinoza; that from 1676 his attitude to Spinoza can be described as nothing short of friendly, even after he had made close study of the *Ethica* from the beginning of 1678, revolting in this only from Spinoza's denial of final cause in things; that, in the revulsion, his native concern for teleology was intensified by study of Plato, and before long the definite religious purpose of all his later thought became fixed; that, in particular, he was helped by Plato, towards 1680, to a conception of substance as active force, whereby he could look to reconcile the new mechanical philosophy of the seventeenth century with final cause in nature; that later on, from about 1684, he came with Aristotle (in more or less Scholastic guise) to see the individual character of his substantialised forces; that thus from 1686, when he wrote his unpublished *Discours de Metaphysique* (in order, apparently, to define his philosophical position against the persistent attempts made to win him over to the Catholic faith), he had at last taken his ground, not again to be changed though with much in it still to be developed; finally, that it was only from this time forward that he began to adopt the hostile tone towards Spinoza that, with some rare and significant exceptions, marks the references of all his later years.

It is impossible here to follow out, even in the most general manner, the evidence (some of it quite new) and the acutely reasoned combinations by which Prof. Stein supports these positions; but some more particular account may be taken of the different stages now demonstrable in the relations with Spinoza. Curious it is, to begin with, that in the earliest years Leibniz couples with the name of Hobbes and other modern philosophers the name of the "Cartesian" Spinoza as readily as that of Descartes himself, though Spinoza was then known only by his more or less free exposition of Descartes' *Principia*. We know that Descartes was not seriously taken in hand by Leibniz till some time (probably rather late) in the course of the years, 1672-76, that he spent in Paris; and the delay is remarkable and unexplained, when some years before he had come into as close contact with Descartes' doctrine as he must have been brought by the exposition of Spinoza (1663) or of other Cartesians whom he mentions. But that in Spinoza, at all events, the interest of the eager learner was keen from the first is sufficiently proved by the citations which Prof. Stein makes. It may be doubted, only, whether he does not go too far, at p. 38, when he ascribes to Spinoza's rather than to Hobbes's influence the declaration of Leibniz in 1671, that he regarded geometry as preparing the way for the philosophy of motion or body and this for the science of mind. A more pointed reference to the succession of stages in Hobbes's philosophic thought there could hardly be. And, generally, it may be said that, the more closely one scans all those earlier utterances of Leibniz, including the two academic memoirs on Motion of 1671, the more evidently it appears that, until he became engaged in serious mathematical work from 1672, it was by Hobbes, of all modern thinkers, that he was first and most powerfully affected. Hobbes, as Dr. F. Tönnies has shown, gave him probably the first dim suggestion of the monadic notion, that was to lie undeveloped for so many years; and perhaps also first made him dream that he could not have worthier life-task than to reconcile the new mechanical doctrines with those interests of religion which had been safeguarded by earlier philosophy. It ought, however, to be added that, if not just at the point here remarked on, Prof. Stein is in general most forward to recognise the influence of Hobbes upon Leibniz.

The second stage is of direct personal relation. Even in the earlier years, it is now known, there had been more correspondence between Leibniz and Spinoza than is represented by the single interchange of letters (on a point of optics) given in the *Opp. Posthuma;* but nothing more passed till after 1675, when Leibniz, having now added a first-hand study of Descartes' philosophy to his mathematical achievements, had his interest in Spinoza renewed and heightened by association (at Paris) with Tschirnhausen, who belonged to the inner Spinozistic circle. It is at this stage and what follows on it that Prof. Stein throws most new light. However little one can imagine Leibniz losing hold of his original philosophic ideas and purposes, all vague as they were, it is now certain that, in 1675-76, he was still so far from seeing his own later way that he was, above all, anxious to seek from Spinoza the help which he had failed to obtain from Descartes. This appears first from Tschirnhausen's recommendation, expressed through Schuller to Spinoza (November, 1675), that Leibniz should be taken into confidence; and, when Spinoza would not straightway admit him to sight of the unprinted *Ethica*, we have now evidence that in 1676 Leibniz never rested until he stood face to face with the Hague recluse. That the two met has always been known from an incidental remark of Leibniz in the *Théodicée* (iii. 376); and that their conversation was not, as there suggested, confined to "anecdotes on the affairs of the time," but extended at least to the Cartesian laws of motion, has also been known, since 1854, from a note, in Leibniz's hand, published by Foucher de Careil. But it is only now, through Prof. Stein's careful research, that we know how serious was their intercourse and how eagerly it was sought by the younger thinker. When Leibniz, in the autumn of 1676, finally left Paris, to take up the official post at Hanover to which he had been appointed some months before, he made his second visit to England and thence took Holland on his way to Germany. But, whereas he was content with a single week on this side of the Channel, in Holland he first spent four weeks at Amsterdam in the company of G. H. Schuller, a medical friend of Spinoza, and, having all the time been closely engaged in commenting every scrap of Spinoza's writing which he could get out of Schuller, was then at last (in November) admitted to the presence of the master at the Hague. And here there is proof, set out at length by Prof. Stein with the supporting documents, that their conversations were frequent and intimate; ranging over a large variety of philosophical topics, and so convincing the shy Spinoza of his visitor's earnestness of purpose as well as ability that he produced for him the carefully-guarded MS. of the *Ethica*, and (apparently) allowed a copy to be taken away of the initial definitions, axioms and propositions.

What then was the outcome of their meeting? Before three months had passed Spinoza was no more; and some months later the *Opp. Posthuma* appeared—from the hand (as Prof. Stein first proved the other year) of Schuller, with whom Leibniz at Hanover remained in busy correspondence. Prof. Stein now puts in print all the more important of Schuller's letters to Leibniz (preserved at Hanover). From these, even without Leibniz's letters (except copies of three) which called them forth, it is evident how eagerly interested he was in everything that could throw light on the as yet unpublished doctrine of the *Ethica*. He is seen, too, when the posthumous volume came at last to hand in January, 1678, throwing himself into the study of it with the utmost ardour. Various sets of critical notes which he at once or upon more careful reading wrote down are extant, and have seen the light at different times within the last half-century. They betray, in general, as little want of sympathy with some of Spinoza's most characteristic positions as with his method of philosophical demonstration. Only when Spinoza comes to deny intellect and will to God as *natura naturans* and to deride the search for final causes does Leibniz feel bound to mark emphatic dissent. There we see him, evidently, touched to the quick in his innermost and earliest convictions. With his singular openness of mind, especially in those unsettled years, he could give to Tschirnhausen and to Spinoza himself the impression that he was free from religious pre-occupation; and, as now appears from a remarkable letter and epigram discovered by Prof. Stein, he could even sympathise with the tone of Spinoza's stern reproof to the confessional presumption of the whilom pupil, Albert de Burgh. But that he had not lost the aspirations (vague enough) of his youth, towards a philosophical irenicon in the interest of religion, is manifest in his prompt rejection of just those conclusions of Spinoza that were at variance with any religion that the world understood. Though Prof. Stein takes Leibniz's original differences with Descartes to have been purely theoretic, there seems good ground for thinking that, from the time when he first really mastered the Cartesian doctrine, a distrust of its practical consequences helped to stimulate his hostility to its principles. It may well then have been an anxious curiosity to see how far Spinoza, by more rigid method or otherwise, had been able to escape the dreaded consequences, that drew him to the Hague. And there finding that the dying man, full like himself of high practical purpose, agreed with him in rejecting Descartes' theory of body and motion, he may for a time have had some real hope that philosophic salvation lay in the way of the mysteriously guarded *Ethica*. The awakening came soon and decisively enough. But that he did not at once—or indeed for some considerable time afterwards—pass out of the mood of sympathetic appreciation is what Prof. Stein has made abundantly clear by all the evidence, new or old, which he here marshals with admirable force. Nor is it countervailed by the fact that in those same years Leibniz could already assume with orthodox correspondents something of his later tone in reference to the hardy Jew. His own formal allowance in 1704 at the beginning of the *Nouveaux Essais*—where Théophile says:

—"Vous savez que j'étois allé un peu trop loin autre fois, et que je commençois à pencher du côté des Spinosistes qui ne laissent qu'une puissance infinie a Dieu"—of itself justifies the inference, which is all that Prof. Stein seeks to draw from the facts as now known, that the years 1676-9, in Leibniz's mental history, may well be called "a period friendly to Spinoza".

The influence from Spinoza, of course, did not end with the extinction of Leibniz's hopes. It was, in a sense, never more effective than when the fully-disclosed doctrine of the *Ethica* threw him back upon the thought of antiquity. If Spinoza, at last, stood declared as the ruthless logician who was not afraid to draw out the extremest consequences of Descartes' mechanical principles, was the correction not to be sought outside of the modern movement altogether? Leibniz's boyish acquaintance with the Greek fountainheads of the traditional philosophy had, as regards Plato, been turned to some extent into direct knowledge by 1676, when he translated the two representative dialogues, *Phædo* and *Theaetetus*. In manifest reaction then from the thoroughgoing naturalism of Spinoza, he is seen, from 1679, almost at a loss to find words that shall express to his correspondents his veneration for the "holy" Plato, especially when maintaining (in the *Phædo*) the supremacy of final causation for any true understanding of nature. Again, to the year 1680 (as Gerhardt, in a special memoir, has shown) is to be referred the short tract entitled by Erdmann *De Vera Methodo Philosophiæ et Theologiæ*, with its identification of the notions of substance and activity; and that Plato's doctrine of ideas gave the suggestion here to the first definite step in the line of development of the monadic conception is rendered very probable by Prof. Stein's careful argument. Still more effectively does he show that the second great step did not begin to be taken till some four years later, and was then taken under the influence of Aristotle, who from that time overshadows Plato in the mind of the eager thinker now pressing onward to a goal of his own that he has begun distinctly to descry. But while his Plato had sometimes been little more than the Plato of Augustin, his Aristotle appears to have been mainly the Aristotle of the Schoolmen and foremost among these of Aquinas. The point, in both cases, is of interest, because it shows him, first of all, concerned to get his thinking into a relation of harmony with the chief religious authorities of Christendom; but, once he had satisfied himself of this—himself, rather than Arnauld, to whom first he sought to communicate his ideas in 1686—he had no hesitation in proceeding to develop these further with all the freedom of conscious power and proved scientific ability. The truth is that, though Leibniz had a singularly open intellect and was always (not only now but even in later age) looking about for suggestions of thought from without, it was nothing more than suggestions that such a mind as his could put up with. The working-out, the combining and reconciling,—these were all his own. It can, however, be shown, as here by Prof. Stein, that not only his central conception of individualised substance, but also that his working-principle of continuity, was developed under Scholastic influence. For years still to come—till he adopted (and adapted) the name 'Monad'—it was Scholastic terms, like 'entelechies,' 'formes substantielles,' and the like, that served his purpose in opposing the hierarchy of active and self-realising substances, each in its degree endowed with a true perceptivity, to every form of the modern doctrine of pure mechanicism—and specially Spinoza's.

With these remarks, the reader interested in Leibniz—as what student of the history of philosophy cannot but be?—must be sent to Prof. Stein's pages for the detailed proof of the novel positions that have here been little more than barely indicated. He will not only find them argued out with a rare circumspectness, but also within the volume will meet with many other unexpected suggestions of no small interest. To mention but one instance: new documentary evidence is here brought to light which throws back the original conception of the *Théodicée* some fifteen or more years from the time of its publication in 1710, and thereby helps to explain the little coherence of its parts (all rather poorly written), and the want of relation which even the latest of them shows to Leibniz's characteristic philosophical ideas, though penned long after these had reached their full development.

THE FUNCTIONS OF THE BRAIN.[1]

In this eagerly looked for work Dr. Ferrier gives a systematic exposition of his own experiments on the functions of the brain, with a critical digest of the results of inquiry into the cerebro-spinal system generally. Struck, as every one must be, with the discrepancy and even glaring contradiction among the results obtained by different inquirers, he yet contends that by carefully directed experiments on animals the foundations of a sure knowledge of the brain-functions can be laid. Accordingly, though he allows that much still remains to be done, he does not hesitate to put forward a body of results, original and collated, which are by no means wanting in definiteness.

The book as a whole cannot but enhance Dr. Ferrier's reputation as an investigator of remarkable acuteness and power. While following with great pertinacity his own very engrossing line of inquiry, he has managed to keep his eye upon the work of contemporary investigators at home and abroad, at least such as bears most directly upon his own. He has, moreover, by intelligent psychological study, fitted himself to probe questions which the most accomplished physiologists that are nothing more are apt to pass by or misunderstand. His physiological results have been obtained with great skill, and, whatever may be said against his interpretations, they are at once clearly conceived and forcibly argued. It is little to say of both that they must henceforth be reckoned with, by psychologists as well as physiologists, for any doctrine of brain in relation to mind.

The first three chapters, dealing with the structure of the brain and spinal cord and the functions of the cord and medulla oblongata, contain nothing particularly new, and may be passed over with the single remark that the author by decisively rejecting the notion that up to the medulla there is anything but "non-sentient, non-intelligent, reflex mechanism," enables the reader to anticipate with some probability his view of the working of higher centres short of the highest. He does, in fact, as the occasion arises, conclude of each higher centre in succession that there is no evidence of its action having a subjective phase till we come to the cortical substance of the brain itself, where the subjective concomitant seems too apparently present for any argument to be thought needful. It should, however, be noted that in his arguments he takes little or no account of the view that there are unconscious and semi-conscious states that may still be called mental or subjective, and are presumed to be in relation with the neural processes of lower centres. In so doing he might, doubtless, plead the example of not a few psychologists; still one could wish that a view which has received not a little support from physiologists had been considered by the way.

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[1] By David Ferrier, M.D., F.R.S. London: Smith, Elder & Co., 1876. (*Mind*, ii. 92.)

When he reaches the mesencephalon (corpora quadrigemina with pons) and cerebellum, Dr. Ferrier is first called to compare the varied researches of others with original (not merely testing) experiments of his own. The centres just named are in relation not only with the multitude of efferent nerves ending under the skin or in deeper-seated parts, but also with the visual and auditory nerves of special sense: and there is given (in ch. iv.) a very careful and distinct account of the variety of impressions that are received and transformed into complicated motor impulses after removal of the cerebrum in animals. It is true that, as the grade of animal life is higher, the action of the lower centres is less independent, and the disturbance of their function on removal of the hemispheres is greater. Still the evidence forthcoming from experiments on animals, supported as they are by clinical observations on man, leaves little doubt that the mesencephalon and cerebellum are specially involved in the three great motor functions of equilibration, co-ordination of locomotion and instinctive expression of feeling. Dr. Ferrier's own experiments, by electrical irritation of the optic lobes in animals, seem to establish that the corpora quadrigemina (with the pons) are concerned in all these functions, but more especially the last two. The cerebellum, by the same means, appears as the great centre of equilibration, dependent as this function is on the reception of extremely varied impressions, tactile, visual and auditory (from the semi-circular canals). At the same time, the cerebellum is not so exclusively possessed of this function as that the cerebral hemispheres do not participate in it, and thus equilibration may be maintained in spite of cerebellar decay, especially when this is gradual. There is no evidence (any more than for still lower centres) that the cerebellum, great and developed as the organ is, has for itself aught to do with conscious sensation or voluntary motion. Neither has it any relation (as was supposed) to the sexual function.

Passing now to the cerebral hemispheres, the treatment of which occupies two-thirds of the whole work, Dr. Ferrier first explains the methods which, as practised by Hitzig and himself, may be said to have opened a new era in the history of brain-investigations. He sufficiently justifies his own method of faradisation by the side of Hitzig's galvanisation, and then defends their joint conclusions against the objections urged by various later experimenters. The defence is too perfunctory considering the eminence of some of the objectors, Hermann not being noticed at all and Dr. Burdon Sanderson being only partially met; and this is the more to be regretted, because the original position is one for which not a little can be said. When it is uniformly found that electrical stimulation of contiguous small areas of the cortical substance results in perfectly distinct movements of limbs, &c., it seems impossible to doubt that the areas (or some of them—more exactly determined by a supplementary process) are quite specially concerned in the actuation of the movements; and they may not improperly be called motor centres, as the ultimate seats whence the different motor impulses proceed, if none higher can be assigned in the whole nervous system and it is not denied that centrifugal fibres conduct downwards from them to lower centres, and so to the muscles. It is the fact, too, as Dr. Ferrier does not fail to urge, that such an interpretation of the experimental phenomena only bears out the clinical conclusions previously forced upon Dr. Hughlings Jackson in his protracted study of localised convulsive movements in man. We need have no hesitation, then, at least in taking the experiments as a clue to the resolution of the functions of an organ which else in its complexity quite baffles scientific analysis, and may now proceed to see how far Dr. Ferrier's methods carry him.

He first offers a simple record of the results of electrical irritation applied to the hemispheres and to the basal ganglia (corpora striata and optic thalami) in a great variety of animals from monkeys to frogs and fishes. The irritation, it is now well known, as applied at different parts, more or less definitely limited in each animal and homologous in the various kinds, results in movements special or general, or in nothing at all that is manifest. Then arises the question of interpretation. Movements, as Dr. Ferrier says, "may be the result of some conscious modification incapable of being expressed in physiological terms, or they may be reflex, or they may be truly motor in the sense of being caused by excitation of a region in direct connexion with the motor parts of the crus cerebri". To decide then, in each case, what is the real character of the movements determined from excitable areas, or to judge what may be the function of the regions that are not excitable, other experimental light is wanted. Dr. Ferrier accordingly resorts next to localised extirpation (chiefly by cautery), and in order to have results, as nearly as may be, applicable to the human brain, he operates chiefly on monkeys with brains approximating to the human type.

He finds, then, from both processes together, that while there is a region that may be described generally as bounding the fissure of Rolando (more particularly the ascending frontal and parietal convolutions with the postero-parietal lobule), the destruction of which causes complete motor paralysis of the other side of the body without loss of sensation, there are other regions the destruction of which causes loss of sensation without affecting the powers of movement. These latter areas, or sensory centres as Dr. Ferrier calls them, lie for sight and hearing (angular gyrus and temporo-sphenoidal convolution respectively) just behind the great motor region; for taste and smell (apparently together at the base of the temporo-sphenoidal lobe) below the others; and for touch (hippocampal region) on the inferior convoluted surface where it turns inwards. The "sensory centres" with the more forward "motor centres" occupy the whole median region of the brain, corresponding with the areas excitable under electrisation. Behind are the occipital lobes bounding the hemispheres backwards, and these yield no positive result upon stimulation, but destruction of them appears to Dr. Ferrier to involve the loss of organic or systemic sensibility. On the other hand the extreme frontal convolutions, which also are not excitable by electrical stimulation, appear when destroyed to carry with them the power of attentive and intelligent observation or the controlling functions of intelligence. As for the basal ganglia, the optic thalami prove to contain the upward paths of sensory impressions, and the corpora striata the downward paths of motor impulses; and the two are so connected as to have a certain independent action, apart from the hemispheres, especially in animals lower than the monkey; but they are in no case sensory and motor centres like the convolutions.

In this summary statement, which seeks to bring together the salient points of Dr. Ferrier's view of the different parts of the brain, it is the doctrine of definite sensory (and motor) centres that most calls for remark. His view of the basal ganglia needs to be strengthened by further research, anatomical and physiological, though it seems not improbable, founded as it is on original experiments and acute criticism of extant results. As regards the functions of the occipital and frontal lobes, his views require much more elaboration before their psychological import can be seriously estimated: indeed he does little more than throw out a suggestion as to the occipital lobes, one too that is contradicted, or at least not supported, in a striking instance to which he very fairly gives prominence; while his supposition as to the working of the frontal lobes has none of the precision that marks the corresponding doctrine of Attention (to which he refers) advanced in Wundt's *Physiologische Psychologie*. But there is certainly no want of definiteness in his assertions respecting the sensory and motor centres lying between the two uncertain regions. Neither, it must be said, is his method of procedure in determining which of the excitable areas are properly motor, and which are only indirectly motor (thence, by inference, sensory), at all wanting in circumspectness. If it is the case that the motor powers remain intact when any part of the brain except a certain region is destroyed, and that they vanish when this region is destroyed and this only; again, within this region, that particular movements are maintained or lost as certain definite areas and these only are left intact or destroyed; while, once more, direct electrical stimulation of the same region and its included areas results always in the very movements, general and special, that are lost by their destruction;—one does not see how the conclusion is to be avoided that this region and the areas within it are the true centres whence movements generally and the particular included movements are, as movements, originated. What meaning is there else in the notion of 'centre' applied to the brain, when (as before said) there is nothing higher upon which the cortical substance is dependent? Take now a particular area lying just behind. Let it be found that stimulation of this results in certain movements involved in the normal working of a particular organ of sense—say the ear. Let it then be found that, this area and this area only being destroyed, complete deafness ensues, but the animal retains all its other senses and its powers of movement unimpaired. Again the conclusion is inevitable that here is a part of the brain which is, to say the least, involved in the sense of hearing as no other part can be, and which may even, with some show of propriety, be called a centre for hearing because there is no higher seat in the cortical substance to which the sound-impressions are carried as they are carried to this one. Of course it should only be after a most varied series of experiments that any scientific mind could dream of making such an exclusive statement, the circumstances that have to be eliminated being extremely perplexing, whether as arising from the fact that there are two hemispheres with a supplementary if not compensatory action in each as regards the other, or from the fact that presence or absence of sensation can after all only be inferred from motor reactions as present or absent. But a candid reader will hardly deny to Dr. Ferrier the credit of having been fully aware of the experimental difficulties, and of having at once honestly and skilfully faced them. What then is to be made of his assertions? Does he prove his case either at all or in the sense for which he contends?

The very definiteness of the view—that extreme simplicity which will make its fortune—is in truth what most arouses suspicion. Not only do other inquirers find direct experimental evidence that the cerebral functions are involved with one another over the hemispheres in the most intricate fashion, but it also seems clear on a variety of grounds that the brain cannot be the simple aggregate that Dr. Ferrier suggests. In the way of direct evidence we have, for example, Goltz declaring, on the strength of new and careful experiments, that removal of *any* considerable portion of the cortex in dogs is uniformly and permanently attended by reduced skin-sensibility, impaired vision, and weakened muscularity on the opposite side of the body.[1] If this be so, either there is no special localisation of motor and sensory functions, but they are mixed up over the cortex, or at least the different localised areas are much less independent than they have seemed to Dr. Ferrier in the ardour of new discovery. One cannot indeed, in hesitating to go all lengths with Dr. Ferrier, straightway adopt the former alternative and refuse to go with him at all, as Goltz seems to do. His experiments are much too exact and varied to be overturned by a different class of experiments not as yet equally varied or exact: they can be refuted experimentally, one would think, only by some inquirer who will perform them all over again and show that they have been at every step misrepresented or misinterpreted by Dr. Ferrier. And this is hardly to be expected, more especially as there is no intrinsic improbability—rather the reverse—in the view, that impressions received by any organ of sense are all carried up first to a particular region of the cortical substance before they are brought into relation with other impressions and with motor impulses, or are otherwise elaborated in the brain. It may well be that there are special sensory regions in the brain-cortex, and that Dr. Ferrier has given the first rough indication of their locality. But even apart from conflicting evidence, seeing what the brain is, and the work it has to do, one must gravely doubt whether there are such sensory centres as Dr. Ferrier supposes.

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[1] Dr. Ferrier has a supplementary note (to chap. ix.) upon Goltz's experiments and makes light of them, partly on the ground that Goltz was evidently unacquainted with his researches on the brains of monkeys as already published in abstract (*Proc. Roy. Soc.*, 162) early in 1875. It certainly lessens the value of Goltz's paper that he makes no reference to Dr. Ferrier's later researches, but that these "satisfactorily account for the phenomena" described by Goltz is more than can be allowed. (For reports on Goltz's researches see *Mind*, ii. 108, 247, v. 254, vii. 299.)

Let it be granted that destruction of the hippocampal region in one hemisphere abolishes tactile sensibility in the opposite side of the body. It is not therefore proved that only touch is thereby affected, or that all tactile representations are blotted out of mental being, as Dr. Ferrier conceives of his "sensory centre" (chap. xi. *passim*). Peripheral impressions may be utterly prevented from coming into consciousness by the cortical lesion; but it does not follow that the last act of the nervous process involved in a conscious sensation of touch is naturally consummated there and nowhere else in the brain, or that in all that region there is no work done but such as (subjectively) we call touch. On the one hand, the cortical substance is thick and histologically by no means uniform in the direction of its thickness: what may be transacted in or through the hippocampal area besides what there happens for touch, Dr. Ferrier's experiments do nothing to tell, except only that other sense-impressions are not there directly cut off. On the other hand, touch (especially if understood, as Dr. Ferrier understands it, to cover besides skin-sensibility of every kind all that others mean by the muscular sense) is a function so extremely wide, being commensurate with the whole of objective knowledge presentative and representative, that to think of it as localised in one single convolution of the whole brain is almost ludicrous. Even to suppose that all tactile impressions, coming by such a multitude of nerves, pass first to this one place is a considerable draft on belief. But assuredly the whole work of touch is not so transacted there as that the area can with any propriety be called the exclusive centre of the sense. And the like must be said of the other all-pervading sense of sight which Dr.

Ferrier would locate in the angular gyrus as a definite centre; as also of the sense of hearing, related as this is, through being involved in speech, to all that is most general in knowledge.

On the whole, then, it seems impossible to allow that Dr. Ferrier has done more than take a first step towards discovering the relation of different parts in the brain; nor is it possible to say thus far that much psychological insight is likely to be gained upon the new line of inquiry. Certainly, although he gives us in chap. xi. a view of "the hemispheres considered psychologically" which is much above the level of common physiological opinion, it does not appear to depend specially upon his own investigations. And that we are now put in the way to obtain a truly scientific phrenology, embodying what was true in the old phrenological doctrine (the notion of definite organ for definite function), but based, as that was not, upon exact anatomical and physiological inquiry in relation to exact psychological analysis—this, which is becoming a fond conviction with many, is, to say the least, a very premature hope. In some respects, the old phrenology was itself more scientific than that which would now be substituted for it. The 'faculties' it supposed were, many of them, such as might well be conceived to be distinctively organised in the brain; though psychological analysis had little difficulty in proving them to be not ultimate functions but only varied aggregates of the true elements of psychical life. Far otherwise is it with the elements themselves, among which there need be no scruple to rank the various kinds of sensation. Differentiated as the organs of the senses are at the periphery, and distinct as the nervous channels of each must be till the convolutions are reached, sensations themselves as conscious states (each sort appearing at the presentative, representative, and re-representative stages, and all being liable to be associated or fused in every possible variety) can neither be supposed to be consummated at their first cortical station, nor be either traced or thought likely to be traced further by any experimental means yet devised.

No space is left to deal with the many other points of psychological interest raised in Dr. Ferrier's important work; chief among them being his treatment of the so-called Muscular Sense, where he takes ground very decidedly against those who attach the consciousness of activity directly to the outgoing of motor impulse from the brain, apart from any backward report (by afferent nerves) of its effect in the muscles. I do not think he overthrows this doctrine, or by any means establishes the contrary one, which he advances in chap. ix., and then not seldom surrenders at the most critical junctures in chap. xi. But there is not a little force in some of his objections to the doctrine, and both these and the new light he throws upon the subject by experiment deserve the most careful consideration. This it may be possible to give on some future occasion, and the rather because the subject has become one of the first importance in the psychology of the present day.

THE PHYSIOLOGY OF MIND.[1]

DR. MAUDSLEY'S well-known work on the *Physiology and Pathology of Mind*, having gone through two editions since its publication in 1867, is now being re-issued in an altered form. The original first part, revised and enlarged, appears as a separate volume, and the *Pathology* as an independent work will follow in due course.

The success of the book from its first appearance has been well deserved. To say nothing of the special value of the pathological section which in the new issue is not yet before us, it is impossible to read Dr. Maudsley's general chapters on the method of psychology and the relation between mind and the nervous system, or his more specially physiological chapters with a psychological reference, or his more specially psychological chapters with a physiological reference, and not undergo a genuine intellectual stimulation. There is also throughout a certain vigour of expression which, if at times a trifle rough or even crude, not seldom is mellowed into a grave eloquence, as when, for instance, he tries to acknowledge the immeasurable debt of the individual to mankind or considers the spectacle of human striving in relation with the universal order. Nor is there lack of true scientific insight, whether as turned upon the workings of mind generally, or upon the special questions that have engaged the attention of recent psychologists. On the subject of unconscious mental life, no English psychologist is more to be regarded than Dr. Maudsley. Few understand as clearly the import of the motor side of the human system—what he calls Actuation or Effection—in the explanation of knowledge. And to mention one other point only, the very last paragraph of his present volume, where he shortly considers why we have no exact memory of pain, contains a suggestion most strikingly illustrative of the advantage, or rather the necessity, in studying Mind, of keeping that unceasing hold upon physiological conditions for which it is his real object to contend.

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[1] By Henry Maudsley, M.D. London; Macmillan & Co., 1876. (*Mind*, ii. 235.)

It is Dr. Maudsley's general position that most claims attention on the issue of the present work as an independent theoretic treatise. What is that notion of 'Physiology of Mind' which he seeks to put forward? The words may either mean, in a general sense, 'Natural Science of Mind,' 'Psychology as Natural Science,' or they may mean a theory of Mind in relation with the special sense of physiological science. To Dr. Maudsley, within the compass of his book, they seem to mean both the one and the other, or, rather, now the one and now the other, according to his mood—and his mood varies. It is not possible to urge more forcibly than he does how unscientific any doctrine of mind must be that is not based on experience, and what a range of experience (all, in a true sense, natural) is available for scientific psychology. In the words of his own summary, "the study of the plan of development of mind, the study of its forms of degeneration in the insane and criminal, the study of its progress and regress as exhibited in history, and the study of biography," may none of them be neglected. All this he understands as included in the inductive method objectively applied to the investigation of mind, and such a treatment might with good reason be called, as he sometimes calls it, physiological. But, of course, the word is ambiguous, and in general, throughout the work, he has the other meaning in view, according to which the scientific doctrine of mind is to be called 'physiology,' because mental phenomena are specially connected with the organic processes of the body generally, and the activity of the nervous system in particular. Physiological investigation of the nervous and general bodily system has in recent times made great and steady progress, and it is Dr. Maudsley's great contention that the hope of attaining positive knowledge concerning mind is bound up with the advance of physiological science in the strictest sense of the term. Therefore, in his first edition, he made an "energetic exposition" of the shortcomings of what he calls variously "the method of introspection," "the method of self-consciousness," "the metaphysical method," "the psychological method," and also "psychology" simply. And though he seeks in the present edition "to maintain the level of a more sober style," because he is no longer so young and enthusiastic, and, besides, "the physiological method" seems to him now-a-days to stand above the need of defence or advocacy, he yet abates not one jot of his old antagonism to any doctrine of mind that is not in the special sense physiological. How does he then understand such a doctrine?

Here again his mood varies, and now in a way that is not a little surprising. When the fit is on him, Dr. Maudsley will hear of nothing but physiology—physiology of brain, and woe be to the luckless introspectionist who ventures to think of profiting by physiological discoveries and would fain thereby seek to "put meaning into the vague and abstract language of psychology: that would simply be to subject physiology to the tortures of Mezentius—to stifle the living in the embraces of the dead". There is no question of brain *and* mind, but it is "brain *or* mind"—"mind *or* brain"; and "mind" is to be understood as "mental organisation," and this again as "that organisation of brain which ministers to mental function"; for "the substance beneath" is brain and only brain. Of course, then, there is no room but for physiology. The scientific inquirer must work up from vital to mental phenomena, and this he can do so perfectly upon the strictly physiological track, that it is nothing short of a pure hardship for him to have to express his results in the terms of psychology—so vague, so obscure, so figurative, so full of theory and the theory false, &c., &c. Because there is continuity between the physical processes of life in the organism and the physical processes that have been discovered to be concomitant with the phenomena of mind, Dr. Maudsley will have it that brain and mind differ not otherwise than an orange touched differs from the same orange seen; and thereupon he declares in a tone he loves to assume—"Above all things it is now necessary that the absolute and unholy barrier set up between psychical and physical nature be broken down". No wonder, if the psychical is just a kind of physical, that he cannot have patience with introspective psychologists trying to link their notion of mind with the rich discoveries of physiology, and must tell them, whether in sober style or not, that they seek "an unhallowed and unnatural union which can only issue in abortions, or give birth to monsters". But when the fit is off, or rather in its pauses—for it is never quite off—we hear another strain. There is a "happy bridal union from which we may expect vigorous offspring," and what may this be? It is "the union of the subjective and objective methods," and this is declared to be the true method of psychology—physiology no more. Dr. Maudsley at an early stage of his exposition adopts Comte's superficial objection against the possibility of self-introspection; but, like Comte himself, he finds he can practise it perfectly well whenever there is occasion (as when is there not?). Hear him when he is in the vein.

"We can observe the associations and sequences of mental states without knowing their physical antecedents. Moreover, when we have discovered by objective inquiry the physical antecedents, we must still depend upon the help of subjective observation in order to establish the exact sequences of the mental states, which we only know by introspection, to the physical states which we observe and make experiments upon" (p. 47). Again (p. 61): "Everybody (?) can perceive that feelings, ideas, volitions are known through self-consciousness, and have only a subjective meaning. And although they may, and no doubt do, correspond to what, I suppose, we may call objective changes in the nervous system, we cannot know them by objective inquiry, any more than we can know the material changes by mental introspection. No observation of the brain, no investigation of its chemical activities, gives us the least information respecting the states of feeling that are connected with them; as has been aptly remarked, it is certain that the anatomist and physiologist might pass centuries in studying the brain and nerves, without even suspecting what a pleasure or a pain is, if they have not felt both; even vivisections teach us nothing except by the interpretation which we give them through observation of our own mental processes."

Nay, so certain is Dr. Maudsley now of the facts of subjective experience, as revealed by self-introspection, that he does not hesitate with the veriest idealist that ever was to declare that, when we are dealing with purely natural forces such as electricity and chemical affinity, and the changes in matter to which they are sequent, all the "sequences, as known to us, are only states of consciousness"! (p. 63).

Might Dr. Maudsley then fairly disclaim, as he originally did, any "absurd attempt to repudiate introspective observation entirely"? Assuredly. But might his critics as fairly charge him with seeking "to employ the physiological method exclusively"? Assuredly also. This is what comes of an exposition so very "energetic" in one phase as to exclude the possibility of there being another or make its later recognition a piece of gratuitous, and not quite harmless, inconsistency. The time is long past—if there ever was a time—when such an advocacy of the 'physiological method' could serve a good purpose. Since when has there been any indisposition on the part of serious psychologists to accept all physiological results, really established, that have a bearing on the conclusions obtained by what Dr. Maudsley himself, as we have seen, allows is the perfectly legitimate and indispensable method of introspective inquiry? Let physiologists bethink them why on their side it is only so recently that results have been obtained worthy of being taken into account for the general science of mind. It will be time enough to deride the willingness of psychologists to appropriate the results of physiology, when physiologists show not less readiness to pay heed to the best results of the introspective method, instead of themselves making crude attempts at psychological analysis. Meanwhile, the energy of Dr. Maudsley's exposition can only have the effect of confirming the unwary among his brethren in the very attitude of psychological ignorance which, happily for himself, he has never seriously maintained.

Curiously enough, too, in this so-called *Physiology of Mind*, while it is those parts of the book where Dr. Maudsley is constrained to become the advocate of the method of introspection that are most to be recommended to physiologists, the more strictly physiological parts are not in turn those which the psychologists need most to lay to heart. Even before the present generation there have been professed psychologists as deeply imbued as Dr. Maudsley himself with the physiological spirit, though unlike him in keeping steadily in view, and not forgetting and remembering by turns, the subjective aspect of mental life. But one thing the psychologists have been slow to learn—the necessity of studying mind on a broader scale than the self-consciousness of the individual or of studying the individual mind in express relation to the social environment wherein it is developed. Now of this necessity Dr. Maudsley has so firm a grasp that, though he impresses it but incidentally in his book, he truly deserves to be distinguished as one of the pioneers in a path of inquiry which English psychologists must no longer delay to tread. True, the introspective analysis they have pertinaciously followed out is the indispensable foundation for effective conclusions on this or any other line of positive inquiry in relation to mind,[1] to say nothing of its import for general philosophy, which comes little into Dr. Maudsley's view. Yet there could be no greater mistake, in trying to deal scientifically with such a subject as Mind, than to be slow to adopt a new point of view, so obviously suggested by the advance of other special sciences and by the growth of the conception of order as pervading every way the stream of phenomenal occurrence. For all the psychological books that have been written, with or without regard to the strictly physiological conditions of mental life, we are still far from understanding the actual process of development of the mind, related as it is in every individual not only to the world of natural experience but to that complex of conditions which, while also natural in a wider sense, are, for men at least, properly called social. All credit is due to Dr. Maudsley for his intelligent appreciation of what remains to be done on this side for psychological science; and only there is room for regret that he cannot advocate this or any other true conception without marvelling overmuch at the intellectual weakness of those who cling to that subjective study of mind which first engaged the attention of philosophic thinkers and may not be neglected to the last even by ‘mental physiologists’.

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[1] This was a point well urged by Mr. Stewart in *Mind*, No. 4, in his short paper entitled 'Psychology—a Science or a Method?'. Mr. Stewart did not, however, carry me with him to his conclusion that psychology is a method and not a science; and when he represented this as the position of earlier English inquirers like Hume, he surely overlooked the emphatic assertion in the introduction to the *Treatise of Human Nature*, that the object was to obtain a "science of man" by the same method of "experience and observation" as had recently led to the extraordinary advance of physical science; though with this was coupled the philosophical idea that the science of man when thus got would form "the only solid foundation for the other sciences".

HUME'S TREATISE.[1]

The revival of interest in Hume's philosophy is one of the most marked features in the thought of the present day. At home, though he never was put outside the philosophic pale (as foreign critics are rather prone to suppose), it is true that, since the generation of the Reids and Beatties and Campbells whom he so greatly exercised, he has seldom been either consciously followed or expressly opposed; and the more remarkable therefore is that new interest, variously begotten, which has resulted already in the edition of his philosophical works so elaborately prefaced by Prof. Green. Nor is the interest less signal abroad, as shown by the two works here thrown together, though they are only the latest among many similar evidences.

M. Pillon, in his striking Introduction, tells us plainly why he and his master, M. Renouvier, have joined to produce this first French translation of the work of Hume's youth. M. Renouvier's doctrine is not such a mere outgrowth from the Critical Philosophy as to be in relation with Hume's thought only through Kant. While holding fast by the "Apriorism" and all the ethical implications of the Kantian doctrine, M. Renouvier's philosophy is a system of pure phenomenism, and rejects the notion of Substance which Kant brought back in the guise of the noümenal thing-in-itself after it had been expelled by Hume. From Locke through Berkeley to Hume as well as Kant, and from Hume and Kant to M. Renouvier, in whom the differences of these two become reconciled,—lies, we are told, the progress of the critical idea in modern philosophy. This may be a somewhat exclusive reading of the post-Kantian movement, ignoring the not less remarkable phenomenism (upon a Kantian basis) of Mr. Shadworth Hodgson, to say nothing of the similar doctrine struck out already in Kant's day by that acutest of his critics, the Jew Salomon Maimon, whose anticipation of his own thinking Mr. Hodgson so generously acknowledges in his new work, *The Philosophy of Reflection*. But the succession has the merit of placing Hume in a light not more striking than true, and it adequately explains the anxiety of M. Renouvier and his able and indefatigable associate, M. Pillon, to make Hume known in France by that earlier and greater *Treatise of Human Nature*, which alone contains his critical doctrine of Substance. The relation between the *Treatise* and the later *Inquiry* (which very soon passed into French as into other languages, to the gratification of Hume's whim that by it alone he should be judged) is on the whole very accurately conceived by M. Pillon; and, if he contends for the philosophical superiority of the earlier work, while asserting their general identity of spirit, he is careful to note also the occasional points where (as on the subject of psychological causality) the shorter *Inquiry* is more explicit. He omits, however, in this connexion all reference to the passages that serve to determine the extent of Kant's acquaintance with Hume, though nothing so nearly concerns his own view of Hume's importance in the general critical movement. If, as the internal, even more than the external, evidence seems to make sure, Kant knew nothing of the *Human Nature*, it was open to M. Pillon to urge that Kant lagged behind in respect of the doctrine of Substance, because he was ignorant of Hume's advance.[1]

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[1] *Traité de la Nature Humaine* (Livre premier, ou 'De l'Entendement'), traduit pour la première fois, par MM. Ch. Renouvier et F. Pillon, et *Essais Philosophiques sur l'Entendement* (traduction de Mérian corrigée). Avec une Introduction par M. F. Pillon. Paris: Au Bureau de la *Critique Philosophique*, 1878. Pp. lxxii., 581.

Hume-Studien. I. Zur Geschichte und Kritik des modernen Nominalismus. Von Dr. Alexius Meinong. Wien: Gerold's Sohn, 1877. Pp. 78

(*Mind*, iii. 384.)

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[1] The internal evidence consists chiefly of the two points: (1) that Kant charges Hume with discussing the question of the validity of human knowledge not in its full generality, but upon the single issue of causation —which is true of the *Inquiry*; (2) that he declares Hume to have recognised only a logical necessity in mathematical cognition—which is again true of the *Inquiry* but the *Inquiry* only. M. Pillon sets out the very different view of mathematical judgments to be found in the *Human Nature*, without remarking the curious change—being a reversion to Locke's position—that had taken place in Hume's mind as to this part

M. Pillon's criticism on Hume's philosophical doctrines is in general not less forcible than his exposition of these is admirably concise; but the justice of his view that "Sensationism" reached its final expression in Hume and stood self-convicted of insufficiency, depends on what meaning is given to that word. Hume did unquestionably carry to a legitimate conclusion Locke's statement of the sources of human knowledge, and, either failing to account for the plain facts of our intellectual consciousness or accounting for them only by a surreptitious assumption of other principles, may truly be said to have demonstrated the insufficiency of Experientialism as it was then understood. But it is not therefore clear that the alternative to "Sensationism" lay in such a system of "Apriorism" as Kant set in its place, and his followers, critical or criticist, would in different forms still maintain. The Experientialism now once more in the ascendant is neither that of Locke and Hume, nor, however allied in spirit, related to it in the way of affiliation. Appearing as the natural reflex of general scientific progress in the interval, it conceives the whole question of Knowledge in a larger way. It does not dream of tracing the growth of consciousness in the individual, psychologically, from the occurrence of a hap-hazard series of impressions passively received, or, philosophically, of making the individual's subjective experience the test of scientific truth. When M. Pillon contends against Hume for "categories, concepts, forms and laws of mind" or what not, in supplement to discrete sense-impressions, he puts only in one way what experientialists at the present day put in another when, besides crediting the individual with a personal activity, and besides allowing for inherited predispositions, they further suppose a non-personal element of knowledge in the slowly

of his doctrine before the *Inquiry* appeared. The *Human Nature* was not translated into German till 1790-1; the *Inquiry* was accessible to Kant in Sulzer's translation from 1755. (This last date is wrongly given as 1775 in the English translation of Ueberweg's *Geschichte*.)

Mr. Sh. Hodgson, in the preface to his new work, p. 14, has some admirably pointed sentences on Hume, but appears to overlook the evidences just quoted when he says: "The Hume that belongs to the history of philosophy, the Hume that roused Kant from his 'dogmatic slumber,' will always be best known to us from the *Treatise of Human Nature*".

developed social tradition of language, &c., moulding into common forms the product of each individual's reaction upon his incidental experience. And if it should be said that this amounts to an abandonment of the position to the adversary the reply is that the rationalist has had gradually to abandon more and more of *his* pretensions from the time when experience was counted as nought towards the result of knowledge, till now he is left only with an assumption of barren forms which, though truly not explicable from individual experience, are there chiefly as a datum to be accounted for by reference to the slow deposit of experience in generation after generation. But, however it be with this question of principle, M. Pillon, it must be granted, follows his master M. Renouvier in giving something more than merely formal answers to the questions that occupy the modern psychological school, and there are several passages in this Introduction well deserving of close attention as examples of a remarkable, and as yet too little known, phase of contemporary thinking.

Hume's doctrine of Abstract Ideas (on which M. Pillon has some acute remarks) is selected by Dr. Meinong as the central subject of the first in a series of *Hume-Studies*, which he has begun to contribute to the *Proceedings of the Vienna Academy*. The doctrine, while set out in a very characteristic and important chapter of the *Human Nature*, is one of those that have no place in the *Inquiry*, and Dr. Meinong's view is that the question of the true relation of the two works can be brought to a settlement only by such an exhaustive scrutiny of their differential parts as he here begins. His tractate (published separately as above) has, however, also the more general character of a contribution to the history and criticism of Modern Nominalism. Thus, he enters somewhat minutely into Berkeley's theory of Abstract Ideas, with which Hume so expressly connects his own, and this of course carries him farther back to Locke, whom Berkeley expressly opposed. Then, although it seems to be his opinion that Hume omitted his earlier doctrine from the *Inquiry* because of its manifest imperfections, Dr. Meinong believes that he finds distinct traces of its influence on the views of later English psychologists.

And he also includes, within his brief but closely-argued essay, an independent discussion of the question at issue.

In his critical exposition of the historically connected views of Locke, Berkeley and Hume, Dr. Meinong offers some fresh observations; as when he very neatly remarks on Locke's paradoxical statement as to the difficulty of forming the general idea of a triangle (which "must be neither oblique nor rectangle, neither equilateral, equicrural, nor scalenon, but all and none of these at once"), that it is based on a confusion of the extent with the content of a notion. It was against this and other statements of Locke's that Berkeley directed his famous protest so often cited as an enunciation of thoroughgoing Nominalism; but Dr. Meinong points out that in reality Berkeley lays no positive stress upon the function of language in generalisation, neither asserting that names alone are general (the true note of Nominalism according to Dr. Meinong) nor even maintaining that names are an indispensable help to conceiving, though it is true that on the one point of the use of language in symbolic thinking he goes to exceptional lengths. Hume, therefore, who does take his stand upon the generalising agency of language, was in error when he supposed that he was simply passing on and confirming the doctrine of Berkeley; and to him, rather than to Berkeley, says Dr. Meinong, should be assigned the name of the father of Modern Nominalism.

This last remark, in the connexion in which it is made by Dr. Meinong, is not without its justification. While Hume expressly declares that "a particular idea becomes general by being annexed to a general term, that is, to a term which from a customary conjunction has a relation to many other particular ideas and readily recalls them in imagination," Berkeley supposes generalisation to consist in the mere representation (suggestion) of a number of particular ideas on occasion of one, and takes representation by means of a name (which is itself a particular idea) to be only one case in which the principle applies, though it is that one which, according to him, has misled Locke and others into thinking that the mind has hold of properly abstract ideas in correspondence with the names. Dr.

Meinong, however, is surely somewhat at fault, when upon that single ground he enthrones Hume in place of Berkeley, and would have it that all later nominalists are what they are because of Hume's example. To say nothing, in the first instance, of an influence from Hobbes (who, before Locke, might be expected to figure in a historical view of Modern Nominalism), what real evidence is there that the thinkers who have come after Hume have been specially affected by his nominalistic utterances? Dr. Meinong refers but to four—the two Mills, Prof. Bain and M. Taine (whom, though a Frenchman, he very properly classes with the English succession). Now among these he finds the younger Mill to be in strictness more conceptualist than nominalist, but in any case to have held a view of abstraction and generalisation very different from Hume's. James Mill and, in one place, Prof. Bain, are found expressing opinions that have some affinity with parts of Hume's doctrine, but there is not the least proof of direct obligation in either case. Finally, of M. Taine, Dr. Meinong can only say (with questionable correctness) that his Nominalism goes farther than Hume's, and is of a type that hardly any thinker of mark would now care to approve. There is in reality, so far as regards the Mills, much more evidence, both external and internal, of influence from Hobbes than from Hume, and the truth about the English thinkers generally is rather this, that from the days of Hobbes (to go no farther back) they have all been nominalistic in spirit. Locke, despite his occasional lapses into ultra-conceptualism, is in the main almost ultra-nominalist, and this most probably in unacknowledged dependence on his predecessor. Berkeley, though most concerned to establish against Locke the individualised definiteness of mental representations, shows himself anything but oblivious of the haunting presence of language with every act of general intellection. Only if Nominalism is defined—with apparent sharpness but really without point—as meaning that nothing is general but names, can it be a question whether Berkeley and Locke are nominalists, and when it is so defined it may well be doubted whether Hume is in truth more nominalist than they. Nominalism would seem to be strictly enough understood when taken as the view according to which the mind is declared impotent to know generally, or to *conceive*, without the help of some system of definite particular marks or signs.

The outcome of Dr. Meinong's very careful inquiry as regards Hume in particular, is that he fails by not taking account of the intension of concepts and by seeking to explain their extension from association of ideas. Hume is supposed by Dr. Meinong to be the first who made Association a general principle of psychological science,[1] and to have been misled into applying it without due discrimination. The principle, it is urged, cannot account for that aspect of the notion which is called its extension, because this, unlike the intension, has no ideal fixity but is liable to vary indefinitely with real experience (p. 30). Perhaps I fail to apprehend Dr. Meinong's true meaning here; but if not, the observation does not seem very much in place. The fact that the extension is really indefinite is not inconsistent with the supposition that the concept became formed in the mind by a more or less definite association of particular resemblances or resembling objects. Nor, on the other hand, is the intension either so ideally fixed as to be practically unchangeable, or itself not amenable to Association (in this case 'contiguous'), whenever it involves a synthesis of a number of attributes found to be conjoined in experience. Hume's doctrine is imperfect in many ways as an account of the psychological formation of the concept, but its fault does not lie in the part assigned to Association (whether by similarity or contiguity). It fails chiefly by not carrying out that reference, begun by Berkeley, to the function of Attention, which is the positive factor in the act of Abstraction.

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[1] M. Pillon, in a short paper entitled 'Quel est le véritable père de la psychologie associationiste?' (*La Critique Philosophique*, 27th Dec., 1877) makes a like claim for Hume, and blames Mill and others for ascribing so much importance to Hartley. Now it is true that Hume published his *Human Nature* eleven years before Hartley's *Observations on Man*, and Mill is clearly wrong in point of fact, when he says that Hartley "was the man of genius who first clearly discerned that the great fundamental law of the Association of Ideas is the key to the explanation of the more complex mental phenomena" (Pref. to his father's *Analysis*, 1869). But, on the other hand, there is every reason to suppose that Hartley, who so scrupulously makes his acknowledgments to Gay, borrowed nothing whatever from Hume; and Mill's very statement proves how much more potent Hartley's influence has been than Hume's upon the later associationists like himself. Everything, in fact, goes to show that Mill got his impulse through his father from Hartley and Hobbes, rather than from Hume; while as for Associationism, its true origins are to be sought further back than in Hume. Berkeley is implicitly a thoroughgoing associationist, and Locke himself, when he speaks (with still earlier sensationalists) of 'compounding,' has partial hold of the general principle of mental synthesis called later on, by Hume and others, Association of Ideas. (This last phrase, it has often been remarked, heads a chapter in Locke's Essay, but only with a quite special reference to the explanation of mental idiosyncrasies in different people.)

One word, before closing, on Dr. Meinong's valuable discussion of the material question. His solution of the various disputes as to the relation in knowledge between the General and Particular on the one hand and the Abstract and Concrete on the other is, in my judgment, essentially correct. There is no generalisation without abstraction, but abstraction is possible without generalisation. Abstracts may well be singular, and, whether singular or general, they are not confined to mere attributes of concrete objects. Generals are always abstract. Concretes are always individual or singular, but the knowledge of them includes only in each case such conjunction of attributes as directly impresses the senses. Individuals are mostly known in a form more or less abstract. These are a few of Dr. Meinong's positions, and the others to be found in his pages, though they do not exhaust the subject, make up a very important contribution to its scientific determination. In particular may be noted his criticism of the common dictum that extension and intension vary inversely —a dictum which, if it implies that all generals are abstract, no less implies that all abstracts are general. Dr. Meinong offers a better statement of the conditions under which the dictum is applicable than is to be found, I think, in any of the books. His *Hume-Studies*, if they may be judged by the first of them, promise to be deserving of all attention.

BACON'S NOVUM ORGANUM.[1]

THERE can hardly be any class of readers of the *Novum Organum* whose requirements will not be satisfied by this elaborately annotated edition. If the famous work has still an educational value, the learners who may be set to master its many difficulties could not desire a better key than Prof. Fowler supplies; and so completely has the task been performed of tracing Bacon's wealth of allusions to their original sources, of giving cross-references to his other works, and of bringing the light of later philosophy and science to bear upon every one of his characteristic statements, that there is no other edition to which more advanced students or the general reader should henceforth more readily turn. If for these, indeed, Mr. Ellis's direction, in the collected edition of Bacon's works, may seem to have been already sufficient, the justification of Prof. Fowler's labours would have to be sought in his supplying the educational want; and it can hardly be said that he does make out a very strong case for placing the *Novum Organum* in the hands of logical tyros. Nobody, of course, can read the pithy wisdom of the First Book without profit; but to justify the prescription of the Second Book in a logical education, more is necessary than the assurance that, at least in some of the 'Praerogativae Instantiarum,' "many of the expressions employed still form part of our logical terminology," or that "it would be very difficult in many cases to describe more aptly and precisely than Bacon does the nature of the reasoning involved" (p. 131). The Second Book, I should say, has now an historical value only, and a general understanding of its terminology, in so far as this has passed into current philosophical usage, would seem to be the utmost that can profitably be required of the common run of students. It is possible, therefore, that not very many of this class will ever come under obligation to Prof. Fowler for the floods of light he throws upon the dark places they would find at every turn of their path.

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[1] Edited with Introduction, Notes, &c., by Thomas Fowler, M.A., Professor of Logic in the University of Oxford, Fellow of Lincoln College. Oxford: Clarendon Press, 1878. (*Mind*, iv. 125.)

For others the special interest of this edition lies in the seventeen sections of the Introduction (pp. 1-151). These are of a somewhat heterogeneous cast and not ordered according to any distinct principle, but they have the merit of bringing together nearly everything that needs to be known for the understanding of Bacon's place in the history of science and philosophy. Though it might not be difficult to add even to Prof. Fowler's extended list of testimonies to Bacon's influence or to cite still other anticipations of Bacon's conceptions than those that are here with so much care brought together, none could be adduced that would in the least alter the estimate to be drawn of Bacon's performance. Nor will the estimate drawn by any dispassionate judge of the whole evidence differ materially (except in one particular) from Prof. Fowler's own. Without being in the least blind to Bacon's philosophic and scientific deficiencies, Prof. Fowler rests upon thoroughly solid grounds his claim to a high place in the roll of philosophic thinkers. "While Bacon (he says) undoubtedly did not possess any extensive or precise acquaintance with any single branch of science, and while, in some respects, his writings did not keep pace with the discoveries of the day, his range of vision covered an extraordinarily vast sweep of knowledge, and his scientific conceptions and the suggestions which from time to time he throws out, occasionally show a marvellous amount of sagacity and penetration." This is a sober strain compared with the indiscriminate panegyric that used to be heard, but the statement is perfectly warranted as against the not less indiscriminate depreciation of Bacon which of late years has become fashionable among scientific authorities.

It is when he treats or whenever he has occasion to touch on the question of Bacon's influence upon his successors that Prof. Fowler's footing becomes less certain. He would fain represent the influence as very considerable, but when he passes from general surmises to specific assertions his slenderness or absence of grounds becomes only too apparent. He does not indeed repeat the common error of Macaulay, Fischer, Rémusat and others, and imagine a profound influence from Bacon on his immediate successor, Hobbes, in the teeth of their complete difference of method and the younger thinker's absolute disregard of the elder. But if he finds any habit of thinking that may with some reason be called national, he must ascribe its origination to Bacon, however it may have been manifested by Englishmen as distinctly before as after him; and if philosophical inquiry in England has at a later time taken any marked directions, these must be supposed to have been indicated or opened up by Bacon, though hardly anything can be shown to have been farther from the thought of the great Instaurator. Thus Prof. Fowler refers to the habit of making sharp separation of Religion and Science, Faith and Reason, and this, though not (as he himself notes) peculiar to English thinkers, has undoubtedly been very marked in the greatest of them from Bacon onwards; but, however the fact may be explained—by national character or otherwise—the habit is certainly not less pronounced in thinkers of English name in a far earlier time and quite other circumstances, for example, in William of Ockham. As regards specific doctrines, one or two of Prof. Fowler's points may be a little more particularly noticed.

He supposes that Bacon's notion of a lower soul in man, shared by the brutes and materially generated, "may not unnaturally have contributed to the formation of materialistic hypotheses as to the formation of the soul in general among his successors, with whom the twofold division disappeared". The facts by no means bear out this supposition. Hobbes, if Hobbes is meant, came by his materialism not through any process of dropping part of the earlier conception of separate souls, but through being so overmastered by the idea of the new (or revived) mechanical philosophy as to ignore the subjectivity of mind in his eagerness to express all experienced change in terms of motion. Locke's speculations, too, as to whether it might not have pleased the Deity to "superadd to matter a faculty of thinking," such as he had analysed it phenomenally, are obviously not less alien from the ancient metaphysical doctrine in Bacon's or any other version. In truth, after Bacon, it was not only the distinction of lower and higher souls that disappeared, but (by the growth partly of physical and partly of psychological science) the whole of that earlier way of thinking, which Bacon himself had been content to pass on.

Take next Prof. Fowler's remark, on occasion of Bacon's enumeration of mental faculties and naïve statement of their mutual relations, that "the sharp line of demarcation drawn here and in similar passages between the office of the so-called faculties was a common feature of the philosophy of the seventeenth and eighteenth centuries, and has only been replaced in comparatively recent times by a more just appreciation of the complexity of our various mental operations and of the number of elements which go to make up some even of those psychical acts which at first sight appear the simplest". Here it is not expressly stated that the English psychologists in these centuries were led by Bacon to divide the mind into 'faculties'; but if it had been remembered that it was precisely the English psychologists, beginning with Hobbes in the very generation after Bacon, who first took up the ground they have always since maintained against the 'faculty'-hypothesis, there could hardly have been a stronger proof given that Bacon exercised no influence at all upon the most characteristically English movement within modern mental philosophy—the continuous pursuit of psychological inquiry in the spirit of positive science. When, therefore, after particularising some others of Bacon's antiquated psychological notions, Prof. Fowler proceeds to say that "it is impossible not to see in these speculations, crude as some of them are, the beginnings of much of the later English psychology which became so famous in the hands of Locke, Hume, Reid, and others," one can only express surprise that he should be able to see it, at least as regards Locke and Hume.[1] As for the anticipations which Prof. Fowler thinks he finds in Bacon of later ethical ideas, it is perhaps sufficient to note his own admission that Bacon "nowhere expressly discusses the fundamental questions of Morals, such as the grounds of Moral Obligation or the nature of the Moral Faculty,"—in short, attempts neither of the characteristic tasks that English thinkers have set before them in the one other department of mental philosophy, besides psychology, which they have specially cultivated.

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[1] The case is different with Reid, who was a strenuous upholder—in British psychology the reviver—of the 'faculty'-hypothesis; and Reid, we know, had an unbounded veneration for Bacon. It is not indeed

Altogether, it can by no means be maintained that Bacon's greatness lay in his definite anticipation of coming achievements in science or philosophy. Science and philosophy, it is not too much to say, would be to all intents and purposes exactly where they are, though he had never been or never written; and there are other names in Bacon's century of which it would be rash so to speak. Does Bacon therefore fall out of the first rank of philosophical thinkers? That is a question of a rather vain description, which different people will answer differently; but the most strenuous of his depreciators will find it hard to name another thinker of the second class who can be compared with him for breadth of view. As a *preacher* in a time of intellectual uprising he has never had an equal.

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necessary to suppose that he borrowed from Bacon in this particular. Still it is significant that his view of the mind's 'faculties' or 'powers,' however elaborately worked out, is almost as naïve and unscientific as Bacon's own.

HUME.[1]

THIS short account by a man of science of one who was more than a man of letters presents some notable features. The biographical part, consisting of forty-four pages in all, is less detailed than could be wished or might have been expected: still the author, with characteristic art, has managed to convey by a few firm strokes a very distinct impression of the manner of man that Hume was; and, few as the pages are, they yet include well-selected representative extracts not only from Hume's charming correspondence but also from the more popular of his essays. He is thus not inadequately portrayed on most of his sides; nor are his foibles and prejudices by any means forgotten in the general picture that is given of placid strength of mind and character. In particular, the reader may carry away from the sketch the essentially true impression of Hume's philosophical activity—that here was a man fitted as few have ever been to sound all the deepest questions of human concern, yet withal one who did not live for that kind of work. The precocious development of Hume's speculative ardour was followed by its contented repression in mature years; while his striving after momentary effect and personal distinction is visible alike in the more than candid self-exposure of his earlier philosophical manner, and, when that failed of the mark, in the polished reserve and studied innuendo of his later. Prof. Huxley makes no pretence that he is dealing with one of the loftier spirits of the race. But if there is one man more than another whose thinking has to be reckoned with in these days it is Hume, and, such as it is, it can have no more fitting interpreter than a man of science.

Though he shows his sense of its exceeding importance by giving to the Philosophy more than three-fourths of the whole space at his command, Prof. Huxley does not of course aim at producing a balanced exposition of the whole. When he has traced Hume's account of the origin of knowledge up to the point when the generalising and objectifying agency of Language comes into play in the form of propositions, he is forced to confine himself to those philosophical topics that are of more general interest to mankind, and which, probably on that account, were those that continued to engage Hume's own thoughts after the wider-ranging activity of his youthful intellect was spent. Upon such subjects as Miracles in relation to the Order of Nature, the Soul, Theism, &c., Hume's ideas get, in some eighty pages, that sympathetic exposition, mixed with vigorous and independent criticism, that was to be expected from his present interpreter. In this place, however, we may rather note a few points in Prof. Huxley's treatment of the foundations of Hume's philosophy, which he has sought to repair and make good in the light of more advanced knowledge.

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[1] By Professor HUXLEY. ('English Men of Letters Series,' edited by John Morley.) London: Macmillan, 1879. Pp. 208. (*Mind*, iv. 270.)

He would amend the scheme of the sources of knowledge by adding to Hume's enumeration of the senses, "the muscular sense, which had not come into view in Hume's time"; by extruding the passions or emotions (Hume's so-called 'impressions of reflexion') as being all of them "complex states arising from the close association of ideas of pleasure and pain with other ideas"; but, chiefly, by positing "as ultimate irresolvable facts of conscious experience" three feelings or "impressions of *relation*," namely, co-existence, succession, similarity and dissimilarity. He is, of course, perplexed by Hume's unaccountable wavering in the matter of Relations, and sees the need of making a clear and decisive affirmation on this all-important head; but, whatever may be said against Hume's uncertain enumeration of the formal elements, it would not be easy for Prof. Huxley to prove his own sufficient for the explanation of knowledge as exhibited by any human mind. Nor is his statement of the material elements up to the mark of modern psychological science when he is content, under the head of Sensations, to add to the usual five senses "Resistance (the muscular sense)," and makes "Pleasure and Pain" a co-ordinate chief head.

Impressions (1) of Sensation, (2) of Pleasure and Pain, (3) of Relations (as above), are hardly an adequate scheme of the "Contents of the Mind".

How the impressions arise or come to pass in consciousness is the next question dealt with, and here Prof. Huxley, while noting again a want of decision in Hume's answers, due (as he thinks) partly to his apparent unfamiliarity with even such knowledge of the physiological conditions of consciousness as was then current, declares for himself "that the materials of consciousness are products of cerebral activity," "effects or products of material phenomena," or, as he says more explicitly in another connexion, "products of the inherent properties of the thinking organ, in which they lie potentially, before they are called into existence by their appropriate causes". In calling them, however, effects of material phenomena, he is careful to explain that he means nothing inconsistent with the idealistic position—"that whenever those states of consciousness which we call sensation or emotion or thought come into existence, complete investigation will show good reason for the belief that they are preceded by those other phenomena of consciousness to which we give the names of matter and motion". And whether these phenomena, in the last resort, are due to the evolution of the mind as a "Leibnizian monad or Fichtean world-generating ego," or are symbols (not copies) of "a real something" in relation with "the part of that something which we call the nervous system"—are two suppositions which, in his view, are equally possible in themselves and equally beyond the possibility of being either of them exclusively established.

There is some very striking expression, on p. 81, in the short development of this view, but the author seems open to the charge of not keeping sufficiently apart two different kinds of consideration. There is, of course, a good meaning in saying that sensations arise when certain changes are effected in the nervous system, and, in this point of view, do not arise without such antecedents or (more strictly) accompaniments. There is also a good meaning in saying that the physiological accompaniments have themselves an expression in terms of conscious experience, and, from this higher point of view, cannot be allowed to be the absolute conditions of mind which the materialists suppose. But what is of chief importance is that the two points of view should be clearly severed, and this they hardly are when it is said that the phenomena of sensation, &c., are, in the "idealistic" point of view, to be regarded as "preceded by those other phenomena of consciousness to which we give the names of matter and motion". From the idealistic, which is the philosophical, point of view, there is in truth no question of a relation of sensation or other subjective experience to anything that is ever called matter and motion. When we speak of such a relation, we are at the other point of view—the point of view of positive science. The question of the "origin" of states of consciousness is, in fact, an ambiguous one; and this, it may be added, makes it especially important in describing their physical relations, which is one question, not to speak of them as "products" or "effects" of nervous processes, when such terms, if at all strictly interpreted, must be held to exclude, or at all events prejudge, the other, or philosophical, question. It is possible that Hume refrained from such a statement as Prof. Huxley offers less from ignorance of such physiology as was accessible to him than because he remembered that he was engaged upon a philosophical inquiry.

On the historic question of Innate Ideas so lightly skimmed over by Hume, Prof. Huxley takes occasion to quote some passages from Descartes' minor writings, which should be noted by students of the history of philosophy as showing how circumspect that thinker could be, when he chose, in his statement of the relation of reason to experience in knowledge. More particularly, they prove him to have clearly anticipated the kind of answer which Leibniz, in the *Nouveaux Essais*, takes, and usually gets, the credit of having made to the arguments of Locke. In comparison with Descartes, Hume is rightly charged by his critic with an imperfect appreciation of the import of the question and an inadequate resolution of it.

Rightly, too (as I think)—to refer but to one other point of the detailed exposition—does Professor Huxley, when dealing with Hume's account of "Abstract Ideas," in relation to language, lay stress on the different cases of concepts, as they stand related or not to definite percepts. While highly abstract qualities of things or relations amongst things may safely be pronounced unthinkable without the help of definite marks and signs, it has been too readily assumed by nominalists that the corresponding words are in like manner indispensable to the mind's *com*prehension of sensible objects. In spite of what Berkeley, once for all, so triumphantly urged against the easy-going assumption of conceptualist thinkers—that there is no more difficulty in the definite representation of generals than of singulars—the circumstances in which concepts are formed are in fact so different as to preclude the possibility of making any hard and fast statement as to the representability or non-representability of generals. When definite percepts are experienced with well-marked common features overpowering individual differences, it is quite intelligible, according to psychological law, that there should arise representatively some *schema* more or less definite which for purposes of (general) thought may stand for the multitude of singulars. This seems to be the view that Prof. Huxley seeks to express in less technical language, and in illustration he very happily refers to Mr. Galton's production of the typical face of a class by superposition of portraits of similar individuals on the same photographic plate.

The earlier chapter on "The Object and Scope of Philosophy," with which Prof. Huxley passes to the second and more serious part of his task, deserves, in conclusion, to be still more particularly noted. Though it may not contain anything that is unfamiliar to philosophical students, it is really, for its length, a very good statement of the meaning of philosophy in relation to the sciences, and also, more especially, of the relation of philosophy to psychology. Taking Kant's famous statement of the business of Philosophy—that it answers the three questions: "What can I know?" "What ought I to do?" and "For what may I hope?" and bringing back the last two questions to the first, he proceeds to maintain that, while that question is distinct from the question of Science or the Sciences: "What do I know?" it can be answered, in its different bearings, only by reference to the results of one branch of science, namely Psychology, which investigates the actual contents of the mind. Here are some of his sentences, bearing on the question of the scientific standing of Psychology:—

"Psychology is a part of the science of life or biology, which differs from the other branches of that science merely in so far as it deals with the psychical, instead of the physical, phenomena of life. As there is an anatomy of the body, so there is an anatomy of the mind: the psychologist dissects mental phenomena into elementary states of consciousness as the anatomist resolves limbs into tissues and tissues into cells. . . . As the physiologist inquires into the way in which the so-called 'functions' of the body are performed, so the psychologist studies the so-called 'faculties' of the mind. . . . On whatever ground we term physiology science, psychology is entitled to the same appellation."

Nothing, again, could be more pointed than his rejection of Comte's plea against the possibility of mental introspection; and when Hume himself—in the remarkable passage of the Introduction to the *Human Nature*, where he argues for an extension of the area of psychological observation to the broader field of human social activity—seems for a moment to anticipate Comte's view in a more guarded form, Professor Huxley is immediately ready with the very pertinent remark that "the manner in which Hume constantly refers to the observation of the contents and the processes of his own mind clearly shows that he has here inadvertently overstated the case". It is refreshing to come across one "man of science"—and him a leader among his fellows—who can enter so sympathetically and thoroughly into the conditions of psychological inquiry; and it may be hoped that his words will not fall idly upon ears that are deaf to voices from within the psychological camp itself. Professor Huxley's appreciation of the scientific character of Psychology contrasts very favourably with the different opinion—specious but hollow—to which Professor Clerk Maxwell has lately committed himself in a bright review of a dull book (see *Nature*, December 19, 1878).

THE METAPHYSICS OF JOHN STUART MILL.[1]

THIS is an examination of Mill's chief metaphysical positions as set forth or implied in his different works, six topics being selected for discussion, namely, Consciousness, Body and Mind, Primary Qualities of Matter, Causation and Uniformity of Nature, Mathematical Axioms and Necessary Truths, General Ideas. A short introductory sketch of the historical evolution of Modern Philosophy, with a more detailed consideration of Mill's particular Antecedents, and a few words of Epilogue, make up the other contents of the volume.

The author, who seems implicitly to follow Prof. Green in philosophy, does in fact aspire to substitute plain speech as regards Mill for his leader's method of innuendo. Sharing the opinion that the English mind touched its high-water mark in philosophy a whole century ago, he seeks to make it good not by oblique hints but by showing the precise particulars in which so much later a thinker as Mill, who is thought by many and doubtless thought himself to be more advanced, falls below the level then attained by Hume; and this is clearly the right way to set to work for the spiritual good of a generation that has had the misfortune to be nurtured on Mill rather than Hume. Nor, as it happens, could the most devout believer in Mill find any fault with the tone of his present depreciator. We have here a perfectly sober attempt from one intellectual point of view to estimate the value of Mill's achievement from another; and the critic is even anxious to make plain, as far as he can, the exact nature of his own philosophical assumptions, so that the reader may fairly judge the issues of the conflict.

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[1] By W. L. COURTNEY, M.A., Fellow of New College, Oxford. London: Kegan Paul & Co., 1879. Pp. 156. (*Mind*, iv. 421.)

The interest of the first part of the work lies in the sketch of Mill's immediate antecedents. Assuming his aim to have been the rescue of mathematics and physics from the wreck of human knowledge wrought by Hume's perverse application of true experientialist principles, the author finds that he was influenced chiefly by three philosophical movements belonging to the interval that separated him from Hume—the Common Sense movement of Reid and his successors, the English Psychological movement continued after Hartley by James Mill, and the Positivist movement of Comte; while from the great German movement by which it behoved him most to have profited, he learned nothing at all. There is truth in the sketch, marked as it is by an honest desire to seize the varied features of Mill's essentially impressionable intellect, but the author seems hardly familiar enough (at first hand) with the movements that had, as he says, an effect on Mill to be able accurately to appreciate its nature and extent in the different cases. As to the fundamental assumption, no proof whatever is adduced that Mill in trying, among other things, to give a philosophical *rationale* of mathematics and physics, had Hume's solvent criticism particularly in view, or was moved by anything but a natural desire, in an age of scientific progress, to apply to the explanation of the best-organised bodies of human knowledge the theory of its origin which came down to him through his father from Hartley, Berkeley and Locke. There is an interesting statement of Mill's opinion on Hume, now first disinterred by Prof. Bain in this number of *Mind* (No. 15, p. 377), which at first sight may be thought to lend a certain countenance to the view often expressed before that Mill set himself to do in a positive constructive spirit a work that Hume neglected for the sport of pricking the bubbles blown by metaphysicians; but the reference is to the historian rather than the philosopher, or, at all events, comes to very little, and I can find no real evidence anywhere that he ever was much influenced one way or another by Hume. That he should not, on the other hand, have been at all influenced by the Kantian movement, appears remarkable only when it is forgotten what the actual conditions of philosophical thinking were in England during the whole generation when he was coming to maturity. Mill published his *Logic* in 1843 at the age of 37. After that time and that achievement he might and did add one thing or another to his acquisitions, but he was not likely to have his general philosophical view materially changed. Now what likelihood was there of his learning much about Kant or anything about Hegel in the earlier years?[1] Even Hamilton, in far more favourable circumstances, had (or shows) almost no knowledge of Hegel and a merely general knowledge of Kant. Because in the present generation any junior student, without knowing German, can make himself acquainted with the whole course of modern German philosophy we are apt to suppose that it was always so, and to judge unfavourably of Mill's range of culture which did not include such knowledge; and the mistake is the more easily made because the time of Mill's effective influence on his contemporaries was a good deal later than the appearance of his *Logic*, and coincided with the period of wider and widening philosophical information. But upon any fair appreciation of the actual circumstances of Mill's intellectual development, the most there is room for is a feeling of regret that one who had such a power to influence his generation should not have been familiar with all the currents of thought that were destined to affect it.

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[1] There was indeed, already then, accessible in English the very elaborate exposition of Kant's doctrine contributed to the *Encyclopædia Londinensis* in five articles ('Kant,' 'Logic,' 'Metaphysics,' 'Moral Philosophy,' 'Philosophy') by Thomas Wirgman from 1812 to 1825; but the labours of this most enthusiastic of Kantian students are hardly more unknown to the present generation than they seem to have been unheeded by his contemporaries. Those who in recent years have succeeded at last in forcing Kant upon the attention of English readers, apparently know nothing of the heroic efforts that were vainly spent towards that end more than fifty years before. Mr. Mahaffy alone seems as yet to know of his predecessor's name: see a paper on 'Kant and his Fortunes in England,' lately contributed by him to the *Princeton Review*, where he speaks in passing of "an article in the *Encyc. Lond.* in 1821 by Wirgman, who was considered as an enthusiast about Kant"—apparently referring to the article on 'Metaphysics' (which however was published as early as 1817). This article contains a complete translation of the *Prolegomena*, much superior to the later translation by Richardson with which Mr. Mahaffy connects his own. Wirgman's exertions deserve some day to be fully acknowledged. He illustrated his various expositions (except the 'Metaphysics') with copperplate diagrams that exhibit the main doctrines of Kant's philosophy in a very striking manner.

And even this regret is not unmixed with satisfaction, since the very limitations of Mill's philosophical view give it a peculiar historical value. It is well that a serious effort should once have been made to account for human knowledge and especially science from the point of view of individualistic experience. Nor is it more remarkable that this task should not have been attempted till the time when the point of view was about to become discredited than it is that the speculative spirit should have blazed up higher than ever before in Hegel after the course of modern philosophy down to Kant had consisted chiefly in a movement of more and more thorough conciliation of the two opposite principles of Reason and Experience. If Mill's Experientialism was a mere survival out of due season, what are we to say of Hegel's Rationalism?

In his critical chapters Mr. Courtney does not make many points against Mill that have not been made by others before, but his points are in general clearly and always neatly made, and the criticism may be profitably read by anybody who is disposed to think that Mill has said the last word on the topics in question. That the case for Experientialism quite breaks down when Mill's doctrine is proved defective or inconsistent, is more than the author contends for. Sometimes he even, by indicating and leaving unassailed the position of later experientialists, appears to suggest that it is rather Mill's individualism that is at fault than the general philosophical attitude which so many thinkers of modern times have found themselves more and more driven to take up; but more probably the colourless references to later phases of Experientialism are to be understood rather as suggesting a measure of Mill's backwardness in relation to his age than as meaning anything in the way of approval. Remarks like that at p. 62—"So little is it true that association explains thought that the reverse is the case: it is thought which explains the possibility of association"; or like that at p. 92 (often repeated)—"Successive sensations can give rise to the conception of a succession of sensations only if there be a mind present to each sensation, holding them in due relations to one another and transforming into permanencies the perishing series of sense-impressions" ; bear in reality as much against the later and wider as against the earlier and narrower interpretation of Experience. And the reply, it may at once be added, which they are most likely now-a-days to evoke from the experientialist, is simply that they must not be allowed to interfere with the work of psychological analysis, or held to be a bar to such theorising upon psychological data as Mill, to the best of his lights, essayed. Their value, ever since Kant first began to give them their current mode of expression, has lain in the warning they contain for the psychological philosopher (or philosophical psychologist) as to the full depth of the problem of knowledge. Of themselves, they give no insight. Are "sensations" to which a "mind" must be present for holding them together, mental or not-mental? If not-mental, how come they to pass into mental forms? If mental, then "mind" is already given in "sensation," and there is not anything necessary for the explanation of knowledge beyond a full enumeration of psychological factors, all equally phenomenal with (however otherwise different from) so-called bare sensation. Or at all events it is only through foregone psychological investigation, pursued in the spirit of the positive sciences, that the philosophical question can be determined. This is the true note of Experientialism late or early.

We may select as a fair specimen of Mr. Courtney's performance his discussion of Mill's view of the genesis of the notion of Extension. Here he can directly confront Mill with Hume, and here he is dealing with a subject that above all others has engaged the attention of recent psychologists. On the whole, his opinion seems to be that the later psychology leaves the question very much where it was, and that Mill in particular, though fairly facing the great difficulty of transforming a succession of sensations in time into an order of co-existence in space, does in reality advance no whit beyond Hume and is rather less deft than his artful predecessor in covering up the weakness of the "sensationalist" position. Unfortunately, Mr. Courtney shows, by his remarks and references at p. 96, that he knows next to nothing of the later scientific investigations (chiefly German) which nobody should now touch the question of Space without having mastered; and even as regards Hume he betrays a certain want of intimate knowledge, or at any rate he misses the points on which it is of real interest to make a comparison between him and Mill. Hume, he tells us, proposed to derive the idea of extension from sensations of colour, but, with characteristic cleverness, turned the mere sequence of sense-impressions thus obtained into the required co-existence of coloured parts by quietly saying that the eye gives the impression of *coloured points disposed in a certain manner*. On the other hand, Mill, as we know, first urges the importance of the muscular sense in conjunction with touch for the generation of the notion of extension; but, as he thinks that we can never thus get beyond a succession of sensations in time, he would explain the element of co-existence in the case by having recourse at last to a power in the eye of taking in a manifold of sensations practically at once, the action of the ocular muscles proceeding habitually 'in a time too short for computation'. Now whatever may be said against the position thus taken up by Mill—and he certainly (as it seems to me) lays himself open to the charge of asserting something very like an original intuition of space after all—this is to be said for him, that he seeks to allow for the respective contributions of sight and touch to the genesis of the notion, that he thinks of the two as having to be somehow equated, and that he accentuates the presence of the muscular factor in both cases; and these, it must be allowed, are considerable advances beyond the position of Hume as stated by Mr. Courtney. But, in point of fact, the position of Hume is very insufficiently stated by Mr. Courtney. Hume does by no means overlook touch as equally with sight a source of the idea of extension; he does not forget that visible and tangible extension have to be equated (though he very coolly assumes that there is no difficulty in the matter—as if Berkeley had never been!); and he even signalises the psychological fact of a 'sensation of motion' (though he strangely connects it only with touch—never with sight, and labours with a most perverse ingenuity to prove it of no account for the genesis of the notion of space). Not only does Mr. Courtney tell us nothing of all this, which is just what is most interesting in any comparison of the two thinkers, but he even distorts the little he does tell when he represents Hume as saying that we obtain a "sequence" of sense-impressions by the eye—the eye which Hume so curiously thinks of only as resting. As regards Mill, I should like to add, in support of what was said before, that his discussion of the psychological question of Space in the *Examination* and of the corresponding philosophical question in the *Logic* affords very conclusive evidence to my mind that he was quite unfamiliar with the remarkable discussion of the ideas of Space and Time filling part ii. of Hume's *Treatise*. Surely he could never have passed this by in total silence, if his object had been, as we are told by the Oxford critics, to save mathematical science from Hume's devouring maw.[1]

Mr. Courtney fancies he has discovered a radical inconsistency between Mill's positions in the *Examination* and in the *Logic*. "The fact is," says he (p. 79), "that Mill as an inductive logician supposes that phenomena (objective facts) are immediately cognised by us, while Mill as a psychologist, a critic of Hamilton and a metaphysician, supposes that phenomena, the facts as immediately cognised by us, are mere subjective presentations"; and he says so more particularly because of remarks like this, which to his "amazement" he reads in the *Logic*—'Propositions are not assertions respecting our ideas of things, but assertions respecting the things themselves'. Others in their turn may be amazed, after all the discussion that has gone on of late respecting 'material' or 'matter-of-fact' logic, that a statement like this of Mill's should not be held to be perfectly reconcilable with a sort of idealism: over and over again the 'matter-of-fact' logicians have declared that, in dealing with facts and things regarded as objective, they mean to prejudice in no way the ulterior metaphysical question. But it is more to the point to remind his critic that Mill himself knew perfectly well what he was about in speaking, as a logician, of 'facts' and 'things'; see the passage at the very beginning of the *Logic* (bk. i. 2, 1): 'When I say, The sun is the cause of day, . . . I mean that a certain physical fact, which is called the sun's presence (*and which in the ultimate analysis resolves itself into sensations, not ideas*), causes, &c.' And the important chapter iii., 'Of the Things denoted by Names,' which until the *Examination* appeared was Mill's chief contribution to metaphysical theory (but which, by the way, Mr. Courtney hardly touches), surely does not err in the direction of Realism.

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[1] In the *Autobiography*, p. 69, he mentions only the *Essays* (*i.e.*, the *Inquiry*) among his philosophical reading; and it is not the *Inquiry*, with its passing reference to Mathematics in a single paragraph, that can have set him (though it set Kant from another point of view) upon defending the reality of mathematical science. On the whole, in the absence of external evidence, it might be doubted, upon the internal evidence, whether Mill ever read the *Treatise*.

As a last remark, it may be noted that Mr. Courtney is rather apt, considering the size of his work, to run away from his subject or to come up to it only after a deal of galloping through the centuries of philosophical thinking; and his statements when he is at the gallop are apt to be looser than they need be. The "two centuries from Descartes to Hegel" (p. 2) were not two, and there is considerable vagueness in the author's next following reference to a "period commencing in the sixteenth century and ending in the eighteenth," whether he means it or not to be same as the "two centuries" just before mentioned. On p. 4, Leibniz is oddly made to follow upon Hume; and what is meant by the "endless analysis of Wolff"? There is a three-page history of the doctrine of Universals in chap. ix. that might be more accurate; and even the occasional references to particular thinkers are not so precise as they should have been if they were to be made at all. Here is one (p. 115): "Kant denied the Power of the individual Self over Volition and Action, and in that sense denied Free Will to the Ego; on the other hand, Free Will, as shown in Morality, is brought back again". When Kant, in Mr. Courtney's phrase, "brought back again" Free Will, was it not to an "individual Self" that he ascribed it? The assertion is led up to through some other sentences, but they do nothing to mend it.

THE BRAIN AS AN ORGAN OF MIND.[1]

DR. BASTIAN has put into these seven hundred pages the result of not a little independent thought and inquiry, besides reproducing in a convenient form a good part of what is generally known upon his subject. Apparently, he has not aimed at giving a complete account of the present state of research into "brain as an organ of mind". Even on topics that specially occupy his attention, his information, wide and varied though it be, is apt to fall short of the reader's natural expectation. For example, he discusses the question of the localisation of cerebral functions as it was left by Dr. Ferrier in 1877, and has nothing to say on the later investigations of Goltz, Munk and others. On the other hand, there is large reference to views propounded by himself more than ten years back, before the new era of experimental activity began. It would seem that he has been mainly concerned, during the whole interval, to note those particular advances in neurological science that had a bearing on his own earlier views. These, we may take it, are now set forth in the present volume with full maturity of expression; and our interest is to understand what are the special contributions to the knowledge of mind in relation to the brain or nervous system which so painstaking and enthusiastic a worker as Dr. Bastian professes to have made.

The book has a certain disorderly appearance from the way in which neurological and psychological chapters are mixed up throughout; and the treatment, in detail, is not in fact as clear and orderly as it might be, especially in those more important chapters towards the close where the threads of the whole inquiry are drawn together. It is not very easy to make out what it is exactly that Dr. Bastian does think on several of the most vital points which he discusses there at no insufficient length; but, as regards the book generally, there is a definite plan running through it, as was indicated in the short notice that he furnished to *Mind*, No. 19, p. 434, though nowhere clearly in the treatise itself. The plan is, after some consideration of a nervous system and sense-organs generally (pp. 1-69), to describe them as they appear in the lower animals up to birds (pp. 70-137), and then, in the light of a general consideration of mind as it can, at bottom, be known only subjectively in man, to make the best suppositions possible as to the kind of mental life which the behaviour of those animals appears to warrant (pp. 138-253); next, to follow the same order of double treatment in the case of quadrupeds with more particular reference to quadrumana (pp. 254-331); and finally, in the latter half of the book, to carry it out in the case of man as far as Dr. Bastian thinks it can as yet be carried—or, at least, upon the particular lines in which he himself is most interested.

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[1] By H. CHARLTON BASTIAN, M.A., M.D., F.R.S., Professor of Pathological Anatomy and Clinical Medicine in University College, London. With 184 Illustrations. London: Kegan Paul, 1880. Pp. 708. (*Mind*, vi. 120.)

Dr. Bastian does not tell us at the beginning, but long before he has done says plainly enough, what he means by Brain and Mind in calling one the organ of the other. His views on this point, which are somewhat peculiar, claim special attention in these pages, and will not be overlooked; but it will be convenient first to note the main points of interest or importance which the exposition offers, on what may be called the common understanding—generally accepted by Dr. Bastian himself—of a relation subsisting between mind and the nervous system. We may pass over the initial considerations as to the uses and origin of a nervous system: they are partly a reproduction of current opinions (Mr. Spencer's and others'), partly dependent on that theory of the origin of life with which the author's name has become so much identified. Touching structure, he is disposed to regard the neuroglia as, at all events in some cases, entering into the circuit of nerve-currents, but he has no such view of its pervading importance as Lewes was inclined to form or as Dr. Edmund Montgomery has (in *Mind*, No. 17) definitely expressed, and he rather supposes that it is the "matrix wherein and from which new nerve-fibres and new nerve-cells are evolved in animals, of whatsoever kind or degree of organisation, during their advance in reflex, in instinctive or in intellectual acquirements". A third introductory chapter deals with the use and nature of sense-organs, since these are so predominant in the nervous systems of the lower orders of animals first to be studied. Here, without referring to the manner and order of development of sense-organs as now traced by embryological inquiry, Dr. Bastian gives a view of the organs of special sense on the common supposition of their being evolved from the simple form of touch; distinguishing besides a class of "visceral sensations," of large account for the animal life, as well as the so-called muscular sense, though this last is here only mentioned in order to be reserved for treatment at the human stage.[1]

The outcome of the following chapters, in which, as before said, the author first makes a comparative survey of the structure of the nervous system in lower animals (from mollusks to birds) and then, in view of human self-consciousness, seeks to interpret the facts recorded of their external behaviour, is that mental life in such lower forms is mainly sensorial and grows more complex with the increased variety of sense-endowments. Besides adducing the evidence of anatomical and physiological facts in support of this conclusion, Dr. Bastian would contend, generally, for the measurement of intelligence by sense-endowment upon the psychological ground (c. xii., on "Sensation, Ideation and Perception," and elsewhere) that higher manifestations of mind can be shown to have a relation to sense, and that the simplest sensation (in us) can be shown to involve conscious discrimination, &c. His expressions, however, seem to want guarding for the purpose he has in view. When he broadly asserts (p. 182) that "Sensation is, in fact, a complex rather than a simple mental process: it is invariably compounded of Cognition and Feeling," one would like to know from him, with some explicitness, what then is to be taken as "simple" in the mental life of the lower animals. Perhaps c. xi., on "Reflex Action and Unconscious Cognition," is meant to supply part of the answer to this question, but as the Cognition there spoken of is mere "organic discrimination" we are still left to seek.

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[1] The reason given (p. 69) for the reservation is that, as 'muscular sensations' follow or accompany and do not of themselves incite movements, they can be known only subjectively or as they are described by our fellowmen. But, on this showing, Dr. Bastian need not confine himself to saying that "it is obvious we can know nothing about them among Invertebrate Animals": we can know as little of them in any Vertebrates that are speechless.

On occasion of Hearing, Dr. Bastian does not omit to make reference to the part played by the Semicircular Canals in the direction of head and other movements.

At the farther stage of his double line of exposition, when he reaches the anthropoid apes, Dr. Bastian finds such unmistakable evidences of intelligence and emotion (like ours) connected with or growing out of their still more varied sense-experience, that he cannot suppress the exclamation, what might their mental advancement not become if only they could help each other forward, in generation after generation, by that means of articulate speech which, in a later chapter entitled "From Brute to Human Intelligence" (somewhat oddly thrust into the midst of his account of the structure of the human brain), he signalises as the distinctive instrument of mental development in man. Other points in the chapters devoted to the lower animals we must here pass by; remarking on the sketch of animal psychology as a whole that, however interesting and suggestive, there is either too much or too little of it—too little for an effective understanding of the particular subject, too much in relation to the general drift of the book.

Coming to the chapters that deal expressly with man, we have first, in a hundred or more pages, a view of the prenatal development, of the size and weight, of the external configuration and of the internal structure of the human brain. Here Dr. Bastian, at various points of his full and careful exposition, has results of original anatomical research to bring forward, though not of a kind that need detain us. It is from c. xxiv. (p. 477) onwards that more detailed notice becomes necessary. Chapter xxiv. professes to deal with the functional relations of the principal parts of the brain. It hardly carries out the promise of its title. There is first an ingenious speculation as to how the cross-relation between the cerebral hemispheres and the lateral halves of the body may have arisen—where it first is manifest—in fishes and become more pronounced in the higher classes of animals. Then follows a section on the functional relations of the cerebral hemispheres which seeks to throw light on "the duality of body and unity of mind"; but with no particular result. Dr. Bastian can only say (p. 485) that while the great commissure, the corpus callosum, seems more obviously to correlate the sensorial regions of the two hemispheres, it must also be supposed to connect mediately the emotional, intellectual and volitional regions; for is there not "manifestly a unity in our emotional, intellectual and volitional, as well as in our sensorial consciousness"? Observations of that kind or such as otherwise make up this section carry us a very little way. Finally, in the chapter, there is presented a rather careful digest of the manifold views that have been held as to the structural relations and functions of the cerebellum; but when Dr. Bastian proceeds to state his own comprehensive view which shall include all the portions of truth contained in any of the others, it is done in words that suggest more questions than they answer: "The cerebellum is a supreme motor centre for reinforcing and for helping to regulate the qualitative and quantitative distribution of outgoing currents, in voluntary and automatic actions respectively; or, more briefly still, it is a supreme organ for the reinforcement and regulative distribution of outgoing currents". How the cerebellum works in relation to the corpora striata, which at a later stage are made of more account for the effecting of movements, is not in any way suggested.[1] Altogether, there is not much to be learned about "the functional relations of the principal parts of the brain" from this chapter.

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[1] At the later place, p. 586, he can only say: "The corpora striata conjointly with the cerebellum are doubtless specially called into activity by the cerebral cortex, in ways which are most important though they cannot be precisely defined". The statement, p. 508, that "the cerebellum may be regarded as an enormously developed supreme motor centre" is not easily reconciled, so far as the word 'supreme' is concerned, with what is later said of the corpora striata. Nor, in face of Dr. Bastian's account of Instinct in c. xiv., is it easy to understand the force of his remark about the cerebellum on pp. 509-10: "That it should appear to have nothing to do with Instinct . . . notwithstanding the fact that it is a recipient of fibres from all kinds of 'sensory' nuclei, is as much in harmony with reason as with experiment—in view of the reflex functions which have been assigned to it".

In the next chapter, "Phrenology: Old and New," Dr. Bastian begins to draw more definitely to conclusions. Here, after a historical sketch of earlier theories of localisation of mental functions, he subjects to special review Dr. Ferrier's allocation of the different senses to particular regions of the cortical substance of the hemispheres. He seems willing to grant that Dr. Ferrier may have detected parts of the brain-surface that are specially involved in the action of the five senses, but he protests vigorously against the notion that the work of each sense is transacted at the particular spot or "centre" assigned. The truer notion of "perceptive centres," he very reasonably maintains, is that which he himself had long before suggested—widely-diffused and interlacing (though still always definite) complexes of cells and fibres. In the matter of detail, he objects also to the supposition hazarded by Dr. Ferrier that the centre for visceral sensations may be in the occipital lobes. The occipital lobes, being later evolved, are, he urges, least of all likely to be concerned in a class of sensations that count for so much in the mental experience of the lower animals, but must rather be supposed to subserve the higher intellectual functions.

It is in this chapter too that Dr. Bastian first expressly brings forward his doctrine of the 'Muscular sense,' though it has to be filled in from supplementary passages scattered through succeeding chapters and from a small-type appendix of some ten pages devoted to a critical survey of opinion upon this vexed topic. The subject is one of those which Dr. Bastian took up at an earlier time and on which he now seeks formally to recapitulate his previously published views, which, in the main, time has only strengthened for him. Brought together from this place or that, his chief points may be shortly stated thus. There is no 'muscular sense' as the name for an original kind of simple experience had in the fact of impulse being sent outwards from the brain to the muscles by motor nerves (as Bain, Wundt and others agree more or less in supposing). A muscular act must first be proceeding at the periphery before there can be any question of our becoming sensible of it, and we do become thus sensible through ingoing impressions by afferent nerves alone—without any backward currents in the motor nerves also (as Lewes was inclined to suppose). But the ingoing impressions by afferent nerves are not only to be set down to the head of touch or the related common sensibility (as Ferrier and others suppose). Besides *conscious* impressions from the skin overlying the muscles, or from deeper-seated parts connected with the muscles, or from the muscles themselves, there are other *unfelt* impressions "which guide the motor activity of the brain by automatically bringing it into relation with the different degrees of contraction of all muscles that may be in a state of action". These last, which Dr. Bastian formerly supposed to pass inwards by afferent fibres from the spinal motor cells (short of the muscles), he now thinks are sent inwards from the muscles themselves, equally with the conscious impressions that come therefrom. That they must be allowed for as an independent element in so-called 'muscular sense' is proved for him by pathological cases in which, though both superficial and deeper sensibility were normally present, the power of co-ordinating movements was lost when the eyes were shut. And, generally, it is by interpretation of pathological cases that he is led to maintain each of the foregoing positions. Taking account of all the various elements together, he prefers to speak of them as making up a complex "Sense of Movement" or *Kinæsthesis* which must be supposed to have its diffuse 'centre' in the brain like other senses; though the "kinæsthetic impressions" are in this always peculiar that they are results—not, like other sense-impressions, causes—of movement. None the less, though they do not initiate movements—only guide in the keeping up of movements once begun—he thinks they may in the 'ideal' form be equally effective with other sensations in initiating the acts called 'ideo-motor'.

Deferring remarks upon any part of this doctrine, let us first follow Dr. Bastian in his next two chapters which may be said to complete his view of cerebral action: they are entitled, respectively, "Will and Voluntary Movements" and "Cerebral Mental Substrata". If, in the matter of sensory centres, he can accept Dr. Ferrier's results as partially true, he is wholly opposed to that investigator's complementary conception of 'motor centres'. Those limited areas of the convolutions bounding the fissure of Rolando whence Ferrier supposes that conscious voluntary impulses are sent out to this or that muscular organ, are, in Dr. Bastian's view, not to be called 'motor' at all, but, if anything, 'sensory' like the others lying farther behind. He takes up this position mainly on the ground of a general analysis of the process of volition. Voluntary action, he finds, is such as is determined by an intellectual stimulus only more complex than in ideo-motor action, and represents nothing in the way of conscious experience but what may be expressed in terms of sensation or ideation. To posit under the name of 'motor centres' special parts of the cortical substance for a function undistinguishable from what is elsewhere called 'sensory,' is therefore unwarranted. Dr. Bastian is of opinion that nothing can properly be called 'motor centre' higher than the corpora striata (and cerebellum), that the fibres running downwards from the cortex to the corpora striata are as strictly internuncial as those interposed between any sensory and any motor ganglion in lower centres, and that the cortical substance itself is wholly used up for 'sensory' purposes, meaning perception, ideation, &c. Without committing himself expressly, he evidently leans to the supposition that Ferrier's cortical 'motor centres' may be more especially involved in the reception of that class of impressions which he calls kinæsthetic, or at least that portion of them (felt or unfelt) that are not properly tactile and traceable to the presumed centre for touch situated in quite another region. And whatever difficulty there may be in imagining such an oddly dislocated structure as Dr. Bastian's "kinæsthetic centre" would then become, it must be allowed that he tries to proceed with much more consistency than Dr. Ferrier; who, after scouting the notion of a muscular sense distinct from touch and common sensibility, cannot describe the general working of the brain without speaking of his 'motor centres' in terms which imply the existence of 'muscular sense' in the most pronounced form contended for by Bain or Wundt. Dr. Bastian remarks this inconsistency in Ferrier (p. 599), and it can have escaped no attentive reader of *The Functions of the Brain.*

But we may now see that Dr. Bastian, much as he strives to the contrary, perhaps cannot help falling into what is radically the same kind of inconsistency. As far as his general conception of brain-action can be made out from the three chapters last referred to, he seems now to make *Kinæsthesis* of no account at all for mental processes, since they may go on perfectly well without it, and now to interpolate it as a necessary link between the other senses and movement in a way that practically amounts to the whole function ever claimed for 'muscular sense'. If, as he supposes, muscular action must first be in actual process at the periphery before there can be any sense of it—or, as he otherwise puts the supposition, if *kinæsthesis* is always result, not cause, of movement—then movement in the human system cannot well be thought to be kept up or "guided" under other conditions than those from which it sprang, and these are supplied by *passive* sensibility, special or common. If *kinæsthesis*, then, is of no account in the case of actual movement—if it is no source of sensori-motor action—how is it to become the source, as Dr. Bastian declares it, of ideo-motor action? The 'idea' (to use Dr. Bastian's term) of a sensation, like sound or colour, which regularly initiates movement can easily be understood to initiate movement also, but how is an 'idea' of movement to become a cause of movement when a sensation of movement is not a cause of movement but only a result? On the other hand, if it be the fact, as Dr. Bastian in general maintains, that voluntary action, and ideo-motor action, involving an 'idea' of the movement to be carried out, are more immediately started from the "kinæsthetic centres," then must the condition of these correspondent with such 'idea' stand in a very different relation to the state of the system during actual movement from that in which the condition (say) of the auditory centre correspondent with an 'idea' of sound stands to the condition of the same centre in the case of actual sensation. Now this radical difference is what Bain and Wundt seek to convey when they oppose 'muscular sense' or 'feelings of innervation' to all modes of 'passive sensation'. The only way, in fact, to escape positing such a difference of conscious experience with the difference of nervous attitude is to deny that there is any sense or experience whatever in connexion with muscular activity first or last.

The subject cannot, on this occasion, be pursued farther, but it must be added that, in any case, Dr. Bastian's "Sense of *Movement*" is inadmissible as a substitute for 'muscular sense'. However unsatisfactory this term may be, it is intended to mark something very different from what the proposed substitute pointedly conveys. The 'muscular sense,' whatever be its precise physiological conditions—as involving ingoing currents or not—is the name for a kind of simple mental experience presumed to accompany the innervation of muscles. The experience is not *of* the muscles as innervated or *of* the objective consequences that follow—sometimes apparent movements of limbs, &c., sometimes strain without apparent movement. When "movement" as such is subjectively apprehended by us, the experience is of a very complex perceptual order, not to be expressed by the term "sense," even though the fundamental factor of the experience may be supplied by the so-called muscular sense: there is involved also an intuition of space (no matter whether original or derived) with much else besides. So far, therefore, from promoting the settlement of the question as to the physiological conditions of the various kinds of simple sense-experience, Dr. Bastian indefinitely complicates the problem by his "Sense of Movement" or new-fangled *kinæsthesis*. The like objection is to be made to his occasional use of the term "Space-sense" borrowed from De Cyon.

The remainder of Dr. Bastian's work—still nearly a hundred pages—is mostly taken up with the question of Language (spoken and written), treated in the light and for the confirmation of his general doctrine of brain-action. Here, once more, he but expounds in a maturer shape views set forth "in embryo" before. The subject is treated in full detail from the pathological side, and as an attempt to discriminate and classify, upon definite principles of physiology and psychology, a great variety of morbid affections that are apt to be confounded, the long c. xxix. (pp. 613-72), on "The Cerebral Relations of Speech and Thought," is worthy of all praise. Even the next and concluding chapter of all, while professing to set out "further problems in regard to the localisation of higher cerebral functions," is almost entirely devoted to a summary of results concerning the function of Speech. With any other of the questions involved in an assertion of thorough-going relation between mind and brain Dr. Bastian does not attempt to grapple. He gives as a reason for so abstaining, that it is hopeless to proceed with any of them till the question of speech is determined; but, though this is plausibly said, more especially in view of his repeated declaration that all higher mental action depends on speech, and though he deserves thanks for doing his best upon the one question which his experience as a physician enables him to treat with some thoroughness, his limitation of the inquiry has the inevitable effect of making his volume, for all its length, a rather imperfect treatise on the subject which it professes to handle. There are other questions, perhaps not less manageable than that of speech, for example—to mention but one—that of Attention as raised in Wundt's *Physiologische Psychologie* in 1875, and just touched by Dr. Ferrier in 1877, which should hardly be passed altogether by in a bulky volume that proposes to treat of mind in relation to brain in the year 1880. Evidently, as before said, Dr. Bastian has been less concerned to write a fairly exhaustive work up to date than to bring together a large quantity of varied materials bearing upon those few aspects of his subject in which he happens to take a special interest.

It still remains to see how Dr. Bastian conceives of Brain and of Mind as related to one another in the way of organ and function. The point is first distinctly brought forward in c. x. on "The Scope of Mind," and his deliverance there is often repeated afterwards in such terms as these: The organ of mind is "that portion only of the nervous system which has to do with the reception, the transmission and with the vastly multiplied co-ordination of 'ingoing currents' in all kinds of nerve-centres"; it does not include any part concerned in the transmission of the 'outgoing current' downwards from the cortical substance of the hemispheres. The reason he generally gives for such limitation is the total absence, as we have seen upon his view, of all conscious experience in connexion with the emission of impulse to muscles; though, even if this were the fact, the reason might hardly be sufficient, in view of the declarations we shall presently hear from him as to the nature of mind. Accepting it, however, we are still in a difficulty. If all structures leading downwards and outwards from the cortex are upon this ground no part of the organ of mind, neither, it would seem, can the afferent lines of the system be any part of that organ, since of (or rather *with*) any process going on in them short of the cortex there is also no conscious experience. Or, if it be said that the afferent lines are part of the organ because the cortical processes (wherewith we are conscious) are excited through them, surely the like must be said of the efferent lines also, when it is not otherwise than through these that the "movement takes place of which there is afterwards a kinæsthetic impression". Dr. Bastian indeed, in his eagerness (as we may suppose) to be rid of a particular doctrine of the 'muscular sense,' does not hesitate at one place to say that "the processes of motor centres seem to lie even more truly outside the sphere of mind than the molecular processes comprised in the actual contraction of a muscle," since these latter "are at least immediately followed by 'ingoing' impressions, whilst so far as we know—that is, so far as any evidence exists—the former are not" (p. 600). Now, there is of course a sense in which anybody may allow that the muscles, interposed as they naturally are between the peripheral ends of the fibres that run from and the fibres that run to the brain, are a part of the organ of mind. But so long as there is a meaning in speaking of the brain and nerves as composing one 'system' implicated with the mental life, it is idle to speak of the muscles which lie external to it as having a closer organic relation to mind than the whole motor side of the system has. "The division of the nervous system into brain, spinal cord and sympathetic system," Dr. Bastian urges with another purpose (p. 151), "is one which, though justifiable enough on anatomical grounds, is much less so from a physiological point of view—the nervous system is really one and indivisible." It is odd then to read immediately afterwards of "certain reservations" that must be made, so that only "almost the whole nervous system" can be regarded as (in the widest sense) the organ of mind. There is peril in attempting to limit and distinguish thus without the semblance of a principle.

As to Mind, Dr. Bastian is mainly concerned, in dealing with its "Scope," to find an expression which shall represent it as not limited to conscious experience, without the awkwardness (or worse) of resorting to the use of contradictory compounds like 'unconscious sensation,' &c. First, however, he begins by dwelling upon the peculiarity of our knowledge of mind—that it starts from and always involves the data of direct subjective consciousness, and he is so little disposed to make light of these as to declare (in a truly philosophical spirit) that, "strictly speaking, all knowledge whatsoever of any *other* natural phenomena is still but the expression and the summation of our own conscious states". At the same time he vehemently protests against the notion that Mind is the name of "something having an actual independent existence—an entity". "The term Mind," he says, "no more corresponds to a definite self-existing principle than the word Magnetism;" and apparently he finds nothing in his philosophical interpretation of "natural phenomena," cited in the last sentence but one, to keep him from adding that "conscious states . . . are dependent upon the properties and molecular activities of nerve-tissues, just as (!) magnetic phenomena are dependent upon the properties and molecular actions of certain kinds or states of iron". It is this notion of an independent entity, he declares, that entails the error of supposing Mind and Consciousness to be commensurate, and though the grounds of the consequence are not made very clear, let it be noted as Dr. Bastian's conviction, in passing. As said before, his main concern then becomes to fix the notion of mind or mental phenomena as more extensive than conscious experience and to do this in a less contradictory way than by speaking of unconscious feeling and the like; and the aim is distinctly meritorious, even though, elsewhere in his book, he may be as ready as another to use the very compounds he condemns.

In point of fact the difficulty is solved by being, as

Hamilton would have said, 'eviscerated'. The question presents itself to Dr. Bastian more especially in this form: Mind as we are subjectively conscious of it appears as "a mere imperfect, disjointed, serial agglomeration of feelings," &c., while the nervous processes upon which we have reason to believe these disconnected feelings, &c., are dependent are parts of one great continuous complex; must we not then suppose that mind is more than the broken series of feelings, &c.. that we are conscious of, and should we not suppose the *un*conscious states to be something else than "feelings" or the like, which are conscious states? The answer is that the name Mind should and must be enlarged so as to cover along with conscious states, dependent as these are on nerve-actions, "other mere unconscious nerve-actions which are contributory to, rather than directly associated with, conscious states" (p. 150)—provided always (pp. 148, 9) these be not outgoing currents. Sometimes Dr. Bastian's expression is so far different that instead of "nerve-actions" he says "results" of nerve-actions; but that he means nothing but objective nerve-processes or "bodily conditions" is proved by his arguing (pp. 149-50) that the objection to coupling such with conscious states under the one head of Mind is based upon our ignorance of the true relation between subjective states and nerve-processes. Are not motions, he goes on to say (recurring at this pinch to the philosophical point of view), after all known to us only in terms of feeling? And who is to declare that there is (as he puts the point more plainly on p. 608) "no kinship between states of consciousness and nerve-actions"? All which appears to come to one or other of two things—either that in dealing with Mind there must be no reference to the nervous system or brain at all but only to certain different kinds of feeling; or that we may assume nerve-processes (always excepting outgoing currents) to be mental occurrences as much and in exactly the same sense as any state of which we are subjectively conscious. The one alternative cannot suit Dr. Bastian desiring to write about Brain as an Organ of Mind from the point of view of the positive sciences. The other can hardly seem to anybody a step towards clearness of scientific vision. Leaving aside his philosophical considerations as irrelevant to the question in hand, we get from Dr. Bastian a solution which simply confuses that distinction of subjective and objective occurrences upon which the phenomenal treatment of Mind is based.

Why too does Dr. Bastian, from the ground whereon he places himself, make in the closing words of his treatise (p. 690) that protest against the doctrine of so-called Automatism—that it is "one in which all notions of Free-will, Duty and Moral Obligation would seem . . . to be alike consigned to a common grave, together with the underlying powers of self-education and self-control"? If he is sure of one thing, first or last, it is that while conscious states may be "a mere imperfect, disjointed, serial agglomeration," there is throughout life an unbroken continuity of nervous processes. The very purpose of his book is to show that whatever may be included under Mind (which with him is no more an independent entity than Magnetism), it can all be expressed as function of a material organism. Nay, on the very last page but one, when he is leading up to his solemn conclusion, he has it that "just as it is the very material motions on which Heat depends which do the work ascribed to Heat, so do the very material motions on which Consciousness or Feeling depends do the work which we ascribe to Feeling". How then does his own position differ from so-called (miscalled) Automatism? Let him show us how he more than the 'Automatists' can rescue "Free-will" from the tomb. As for "Duty and Moral Obligation," it is somewhat late in the day to speak of them as kept alive by any particular theory of mind.

On the whole Dr. Bastian cannot be said to have written a satisfying book. Still he has written one that is full of the most varied information, collected with unwearied diligence and no common earnestness of purpose; he has propounded a general theory of brain-action which displays a much juster appreciation of the complexity of the facts than some other theories in vogue; and his psychological observations, while always based upon solid study, not seldom give evidence of remarkable insight. Psychologists would do well to have the book by them for reference on many subjects.

BERKELEY.[1]

THOUGH Prof. Fraser can truly describe this volume as "an attempt to present for the first time Berkeley's philosophic thought in its organic unity," he does not now for the first time put forward the conception upon which it proceeds. This is that Berkeley, in his first as in his last works, was concerned always to establish a general philosophical conclusion as to the relation of finite minds to the Infinite Mind, and is misrepresented when special importance is attached to the particular psychological doctrines by which he began to indicate the philosophical position. Prof. Fraser suggested his view in the plainest possible manner before when, in his handy *Selections*, he placed the full text of the *Principles of Human Knowledge* before a reprint of the earlier *Theory of Vision* from which several points of psychological interest were omitted; and, further, when, in a second edition, he made way for a fuller exposition of Berkeley's philosophical standing, by withdrawing just those of his original extracts from the *Vindication of the Theory* that are of real psychological importance, as giving precision to the looser argument of the *Theory*. Nor, on these earlier occasions, did he merely suggest his view of the subordinate account that should be made of the psychological part of Berkeley's writings. He expressed himself as strongly in this sense before as he now does anywhere in the present volume.

The view is, of course, perfectly well justified, and Prof. Fraser could hardly adopt any other in a work that aims at presenting the general characteristics of Berkeley as a philosophical thinker. Yet it is well to note why there should have been so strong a tendency to give prominence to the psychological first-fruits of Berkeley's inquisitive spirit, that his name remains associated with a theory of vision as much as with the doctrine of immaterialism which early and late he was above all concerned to enforce. It can only be due to the thoroughly scientific manner in which he singled out a special psychological question and proceeded to answer it. That he solved as well as raised the question has been much too hastily asserted by Mill and others; but, while at the least he made determinate advances towards its settlement, nothing can rob him of the distinction of having been the first to mark it out in the positive spirit of the scientific psychologist. Though he himself calls it a question of "philosophy" (*Vindication*, § 43), his opposition of it as such to the related questions in "geometry" and "anatomy" would leave no doubt that he means here by philosophy exactly what we now understand as psychology, even if, in an earlier paragraph of the *Vindication* (§ 17), he had not formally protested against his opponent's reference "to unknown substances, external causes, agents, or powers," instead of to "ideas" or the simple facts of conscious experience. His treatment of visual perception should be compared with the best work that had been done before him on the subject, as by Descartes, if the full measure of his scientific advance is to be understood.[1] Locke had mean-

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[1] By A. CAMPBELL FRASER, LL.D., Professor of Logic and Metaphysics in the University of Edinburgh. ("Philosophical Classics for English Readers.") Edinburgh and London: Blackwood, 1881. Pp. 234. (*Mind*, vi. 421.)

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[1] This is not, however, the opinion of Descartes' latest expositor, Mr. Mahaffy, who writes thus in the volume he has contributed to this same series of "Philosophical Classics":—"How far he [Descartes] was in advance of his day may be seen from the 6th Discourse [of the *Dioptric*], in which he explains the perception of distance, and lays down explicitly all the arguments and illustrations used long afterwards by Berkeley in his *Theory of Vision*. It is impossible that Berkeley can have been ignorant of Descartes' *Dioptric*, and yet how he could claim any originality whatever on the subject is passing strange. The convergence of the optical axes, and how this may be supplied by successive observations with a single eye, the varying colour of the objects, the greater dimness, the number and kind of intervening objects, the uncertainty of all these various indices—all this, which Berkeley urged, is found in Descartes' *Discourse*; nay, even the illustration of the moon looking larger near the horizon than when high in the heavens." (*Descartes*, p. 150.)

What is "passing strange" is how Mr. Mahaffy can have so written. It certainly is, as he says, "impossible that Berkeley can have been ignorant of Descartes' *Dioptric*". Berkeley may be said to have had it for his first object just to overturn the doctrine that he found there. In section after section of the *Theory*, when he is stating the opinion of the while given a psychological turn to men's thought, though himself little concerned about merely psychological conclusions; and, as evidence of the influence exerted on so many generations of English thinkers since, nothing is more significant than that the first of Locke's successors, even less inclined as his religious purpose made him to stop short at psychology, should have carefully kept back the general philosophical conclusions which he had already matured, till he had first shown the world what kind of particular question in mental science could be resolved by the new way of "ideas".

Though making light of its more immediate import, Prof. Fraser gives at least a general statement of the fundamental arguments of the *Theory of Vision*. He is not in the same way careful to do the like for the argument, again psychological, which Berkeley places in the forefront of the *Principles* and declares to be so all-important in its bearings on the philosophical conclusion of the treatise. Berkeley's explanation of *generality* in knowledge has had too much rather than

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"optic writers" before proceeding to refute them, it is plain that he has Descartes' own exposition rather than any other (such as Malebranche's) in view. Take, for example, § 19, where he says—"I know it is a received opinion that, by altering the disposition of the eyes, the mind perceives whether the angle of the optic axes, or the lateral angles comprehended between the interval of the eyes or the optic axes, are made greater or lesser; and that, accordingly, by a kind of natural geometry it judges the point of their intersection to be nearer or farther off". If there could be any doubt that Berkeley has here in view the passage in Descartes' *Dioptric*, vi. 13, where occur the words "ex geometria quadam omnibus innata," the point is settled by his quoting it in a supplementary note to the second edition (1710) of the *Theory*. Descartes, besides, is twice mentioned by name in the *Theory*—once in connexion with that very subject of the low moon out of which Mr. Mahaffy makes his climax. But the serious thing is not that Mr. Mahaffy should have hastily charged Berkeley with ignoring Descartes: it is that he should have represented Berkeley and Descartes' doctrines as being the same. Berkeley's manifold references or allusions to Descartes are all, as said before, with a view to refutation. If he refers to all or any of the points mentioned by Mr. Mahaffy, it is to show that their true import had been quite misunderstood by Descartes and others—that the facts need to be interpreted as "ideas," *i.e.*, psychologically, if they are to have any significance for the real question of vision. This is the true Berkeleyan note, and there is hardly a trace of it in Descartes' chapter vi. It may be added that Mr. Mahaffy is particularly unfortunate in his climax. Not only was the question of the moon on the horizon discussed, as Berkeley himself notes, by Gassendi, Hobbes, and others, as well as by Descartes; but if there is one solution more than another that he is concerned to explode it is just Descartes' (as it had been more recently revived by Wallis).

too little importance attached to it ever since Hume confounded it with his own nominalism ; and his ardent polemic against " abstract ideas " proves, upon closer inspection, to have really very little to do with the question between materialism and immaterialism as he argues it in the body of the work. All the same, it is a rather serious omission on Prof. Fraser's part to have made no reference to the negations or assertions of Berkeley upon the subject.[1] Berkeley's own vehemence of statement is hardly to be understood save on the supposition that he thought he had made something like a psychological discovery and was bent on setting it forth. It was truly no great matter ; his notion of generalisation applying only to a very limited class of cases, and his point, such as it was, being made at the sacrifice of such insight into the function of language as had begun to be gained by Hobbes and Locke. But it is interesting to see how pertinaciously psychological Berkeley could be on occasion. Whatever else he was, they have not erred who rank him with the psychological thinkers of modern days.

It is needless to dwell on other points in Prof. Fraser's exposition. Nobody could write on Berkeley with such fulness of knowledge or could well have used his knowledge to better purpose within the narrow limit assigned. Chapter ii., dealing with " Locke on Ideas and their Causes," for the understanding of Berkeley's start, may just be mentioned as particularly effective. Not less so, in another kind, is the concluding chapter, which draws out the issues of Berkeley's thought in the light of later philosophy. The new biographical matter upon which Prof. Fraser has been able to draw—about eighty letters from Berkeley to Sir John Percival, afterwards Earl of Egmont, running from 1709 to 1730—tells something of the reception awarded to the new doctrine on its first appearance. It also for ever disposes of the legend of Malebranche's death. Berkeley, writing from Paris in Nov., 1713, speaks of being about to see Father Malebranche, but he is now proved to have been in England when the aged Oratorian, some two years later, died.

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[1] There is just the faintest allusion to it at p. 53, and, again, at p. 60. Two casual references long afterwards (pp. 192-3), in a different connexion, will convey no meaning to the reader who does not know Berkeley at first hand.

THE HISTORY OF PSYCHOLOGY.[1]

THIS book is too full of matter for detailed criticism in present circumstances, but there should at least be no more delay in following up the brief notices already given of its two parts, as they appeared, with some more adequate account of the kind of instruction which it makes the first systematic attempt to furnish to students of psychological science. In the author's view, Psychology has now reached a critical stage in its course, when future progress depends not least upon a true understanding of the path, or paths, it has hitherto traversed. It has at last, after whatever devious wanderings and changing fortunes, following upon the early start it got from Aristotle, won recognition as an independent science in the modern sense, and, if it is henceforth to be pursued without more interference from metaphysical speculation than any other science must submit to, its past history cannot be too closely scanned in or out of relation to general philosophy. Of historical consideration applied to psychological notions there has, of course, been as little lack as to philosophical thought in general. Zeller is there, for the ancient world, with his mine of psychological as of other information, as indeed no historian of philosophy, whether on the wider or narrower scale, can avoid making mind the very first of his topics. Neither have some of the more distinguished among recent psychologists neglected the help to be got from historical consideration; W. Volkmann especially, in his comprehensive *Lehrbuch der Psychologie*, having displayed extraordinary research of this kind in illustration of his own scientific positions. But History of Psychology, as a continuous tracing of the whole conception men have struggled from the beginning to form of the mental life they distinguish within their being, as yet there has been none. This is the deficiency which Prof. Siebeck here sets himself to supply.

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[1] *Geschichte der Psychologie.* Von Dr. HERMANN SIEBECK, Professor der Philosophie an der Universität Basel (1880), Giessen (1884). Erster Theil. Abth. 1: "Die Psychologie vor Aristoteles"; Abth. 2: "Die Psychologie von Aristoteles zu Thomas von Aquino". (Gotha: Perthes, 1880, 1884. Pp. xviii., 284; xi., 531. (*Mind*, x. 289.)

It is not surprising that in such a first effort he limits the field of view by taking no account of Oriental ideas except in so far as, at different times, they can be proved to have directly influenced Western inquiry; but, with the help of recent investigation of human origins, he does not fail, in a general introduction (pp. 1-29), to begin the story from long before the time of systematic reflexion. An "anthropological monism"—which recognises, but leaves aside for philosophical consideration, the transcendent aspect of consciousness, and confines itself to the facts of psychical and psychophysical experience in their positive relations—is, in his view, the outcome of the more developed psychological activity of the present century, prefigured at every earlier stage according as the research was conducted in a scientific spirit, and by nobody so decidedly as by Aristotle. The goal, however, has been approached or reached from an original position of crude (objective) dualism. Man, in the earliest dawn of thought, has everywhere been regarded as a compound of two separable beings, soul and body, one within the other—a conception, as the author well urges (pp. 6, 7), suggested in the natural course of waking-experience, and not only by the intermittent phenomena of dreaming or the supreme crisis of death. The problem, then, is to understand how, when express inquiry began in Ionia some six centuries B.C., it has tended by whatever variety of ways towards the actual result.

The whole exposition will fall into three main divisions, of which but one is yet completed in the two sections of the present volume. Vol. iii. is reserved for the mass of scientific work that, in this century, has followed the critical investigation of Kant. In vol. ii. the modern movement till the end of last century will be traced from its first beginnings within the Middle Age—in Roger Bacon after Arab initiative towards positive inquiry, in the Nominalists and even in Duns Scotus. So much of mediæval thought being still left over, Thomas is made the final term of the present volume, because in him the Aristotelian doctrine attained its utmost development —in accommodation to the Christian scheme of life which Europe had meanwhile adopted, but still in professed agreement with the conceptions of the master who first gave definite form to psychological science. Within the volume, the special work of the historian is to show how the decisive achievement of one man was prepared by the various labours of many before him, and affected all later thought about mind for at least 1500 years. In the execution of this task nothing is more noteworthy than the author's width of survey, beyond the conventional lines of treatment. Thus, in the period after Aristotle, great prominence is given to Galen, whose influence, as regards all that concerned the physiological conditions of mental life, superseded Aristotle's own, and remained predominant till Harvey's discovery prepared the way for a truer conception of nervous function; but also at the preliminary stage Prof. Siebeck is able to trace with effect, in what is reported of earliest medical work, the opening of more than one vein of later psychological theory. And of the plan of treatment generally, it may be said that it displays a judicious tempering of regard for mere chronological order with topical consideration. Whether he is dealing with single thinkers of critical importance, like Plato and Aristotle, or with periods in which multitudes of lesser men carried forward the inquiry upon this line or that, the author makes such a division of subjects as that effective comparison of the state of psychological knowledge at the different stages is always possible. Mention should also be made of two chapters of special importance (ii. 130-60, 331-42), in which the development of the notions of "Vital Spirit" (Pneuma) and "Consciousness" is continuously set forth at those points of the history when, after long elaboration, they acquired the deeper significance which they were destined to receive and thenceforth retained.

Aristotle, as the central figure, naturally takes the largest space (115 pp., followed by a dozen pages more of summary criticism). Through him Psychology became definitely constituted as a special science on a basis of positive observation; for, though in modern times it has had again to conquer a place among the new divisions of knowledge, nothing is so remarkable as Aristotle's anticipations of the most advanced doctrine as to its scope and method. By comparison with the natural sciences in their positive form, psychology has indeed a history of exceptional length, and also a progress which, though slow, has been continuous and steady in the main; the nature of its subject-matter explaining at once how the progress has not been faster, and how it was so early begun. Yet, early constituted as it was, the science of mind was by no means the first achievement of human intellect on awaking to reflexion. Two centuries of strenuous thought passed before mind was so distinctly conceived as to become, with Plato, the subject of special inquiry. The aboriginal dualistic conception of soul as a separable entity spread somehow through the body was there, lingering on for future transformation, but at first it was quite submerged by the thought of finding one universal expression for the whole variety of human experience, which had now been taken into view. A "hylozoic monism," without distinction of mind, or even of life, from other change in things, was the earliest express theory of the universe as a whole. Only when, still keeping in view the need for a comprehensive theory, successive thinkers became struck with this or that aspect of being as more important than others, and in particular awoke, however partially, to contemplation on the facts of subjective experience, and were faced by the contradictions of sense and cognition, did the primitive dualism begin to re-assert itself with new fulness of meaning as the true account of human nature; not without help, as already suggested, from the lights afforded by medical practice. All this is worked out, at adequate length and with great clearness of insight, by Prof. Siebeck. When he passes to Plato, through the Sophists and Socrates, in both of whom, to whatever different purpose, the subjective attitude necessary for psychological science is seen to be decisively gained, he finds it necessary to enlarge to an extent only less than afterwards as regards Aristotle. In Plato the rehabilitated dualism of natural fancy becomes metaphysically theorised with an ethical purpose, yet so as to give occasion for a detailed survey of the whole range of mental life such as no one (at least in the West) had ever undertaken before. None of the phases of human activity, theoretic or practical, remain any longer in shadow; and there is left for Aristotle only the task of re-investigation from a more disinterested point of view—in the spirit of science rather than with reference to a moral and religious ideal. How this was carried through we may here best indicate, not by any attempt to examine Prof. Siebeck's admirable exposition of the Aristotelian doctrine or his view of its strength and its shortcomings, but as we follow his account of the later psychology, and note with him the long-protracted efforts made by professed adherents to understand and develop, or by others to modify and supplement, the scientific scheme with which all had henceforth to reckon.

Two general movements are distinguished by the historian within the time while as yet the Greek (or Græco-Roman) mind had not become dominated—though towards the end it was largely affected—by religious ideas of Oriental, chiefly Hebrew, origin: (1) a complex and highly-diversified movement of "monistic naturalism," which evoked (2) a sharply marked "spiritualistic reaction". The first rubric is intended to cover the Stoic and the Epicurean as well as the Peripatetic psychology, with the notable contribution made by Galen and other physiologists engaged in medical practice. Upon this movement as a whole (if it may be called one movement), Prof. Siebeck is constrained at the end to write the word failure; though the observations he records as made within the period, in the series of well-ordered chapters, so brimful of matter, occupying pp. 128-296, may not seldom incline the reader to demur to his depreciatory estimate. It is certainly impossible not to be struck with the advance then made beyond Aristotle, at a multitude of points, towards the accepted positions of later psychological science. If, outside mathematics, there was any progress being made in scientific knowledge, it was mainly in the psychological field. Yet Prof. Siebeck is doubtless justified in asserting that Aristotle's naturalistic successors failed to maintain the inquiry at the level to which he had raised it. When they did effective work, it was by following the lead he had given; and in general they were far from comprehending the profounder (philosophical) ideas that had enabled him to bring mind into line with other subjects of scientific inquiry or even give it scientific treatment in advance of the others. In particular, the conception of man as an organic unity, whereby he was able to give a "real" explanation (in physiological terms) of mental processes and functions—short, it is true, of the highest—while maintaining the independence of their subjective character and reserving their philosophical import, was with difficulty kept by his Peripatetic followers from passing, and often did pass, into an assertion of mere materialism. Epicureans and Stoics, on the other hand, never either of them attained to the height of the conception, but each, in their different ways, secured a real ground of explanation at the sacrifice, generally, of the more distinctive characteristics of mental life.

It is to help in threading his way through the complex tangle of Post-Aristotelian inquiry that Prof. Siebeck finds it expedient, or necessary, to follow out separately, in a preliminary chapter, the history of the notion Pneuma; incorporating, in somewhat reduced form, a research he had previously published in the *Zeitschrift für Völkerpsychologie u. Sprachwissenschaft*, xii. 4. From being employed originally, in the sense of air or warm vapour, to designate the inner active principle in man regarded as made up of two extended entities, soul and body, one within the other, Pneuma comes in course of time to be understood as soul in a sense exclusive of all material attribution, and more especially, from the religious point of view, as the element in human nature setting man in felt relation with Deity. But while soul, under whatever name, is becoming conceived antithetically to body in every respect except in that of real existence, Pneuma tends also to acquire the other import of intermediary between the two opposite terms. The primitive crude dualism thus passes into a trinalism of human nature, not only for Christian teachers and for such metaphysical thinkers as join to supreme concern for an ethical or religious purpose an interest in theoretic explanation. Scientific inquirers also, who start from no definite metaphysical position, are seen to be moved in the like direction of interpreting subjective mental experience, once brought distinctly within ken, as proceeding in connexion with bodily changes through a special agency called Vital or Animal Spirit. To all such, Pneuma, in its original sense of an attenuated matter like air or vapour, offers itself as exactly the mean term that is wanted. Material like the body into which it enters and out of which it passes, it is by its invisibility and rarity akin to whatever can be thought of as opposed to gross material substance and thus to mind or soul subjectively apprehended. Especially will this consideration impress itself upon physiological inquirers, who, as they learn more and more of the detail of vital processes among which respiration stands foremost, have the task of understanding the bodily life in connexion with the mental life so intimately blended with it. It is thus that Galen and his medical fore-runners and successors acquire a peculiar importance in the history of psychological theory. Recognising, as Aristotle did not, the special relation in which the nervous system stands to mind, they elaborated a theory of nerve-action by means of "animal spirits" which, however erroneous from their failure (though distinguishing between arteries and veins) to anticipate Harvey's revolutionary discovery, served to give a truer representation than Aristotle's of the actual physical basis of mental processes and has left abiding traces in common speech. Aristotle himself did not, in his physiology, wholly dispense with the agency of Pneuma in the sense of animal heat; but, besides the physiologists, it was the Stoics who most persistently took advantage of its ambiguous character, and, while freely using it as a physical agent wherever called for, sought also to express by means of it not only the being and activity of mind but also the abstract qualities of things through which they become the subject of thought. The notion, in short, is one that, as it is employed, gives the measure, at every stage, of the advance made, on the one hand, in power of abstract conception, and, on the other, in determination to keep the realm of properly subjective experience, as it gradually opens up and deepens, in relation with the common ground of physical experience upon which men meet and from which all their inquiry starts. But the final transformation, as Prof. Siebeck shows, which it underwent before it became fitted to serve the purposes of the spiritualistic reaction against naturalism that closed the movement of Pagan thought in antiquity, as also the wants of upcoming Christianity, was operated through Hebrew influence. While the Hebrew mind had also started with a physical conception of the active principle of human nature, corresponding to the original sense of Pneuma, it had always viewed this principle as divine in its origin and as a bond between creature and Creator. It is interesting then to note that in the Alexandrian Jew Philo the two currents of Greek thought and Hebrew feeling first come manifestly together, and, as it happens, Philo uses the word Pneuma at different places in such a variety of senses, early and late, that the whole development of the notion can be traced within his writings.

The other notion, of Consciousness, treated apart by the author does not accomplish its development till the next period, when the spiritualistic reaction of the Neoplatonist school had set in. In the section (pp. 297-357) given to this movement of reversion from Aristotle to Plato, its causes and general character are first set out before the psychological advance, for which the school has not received sufficient credit, is chronicled. The advance, due chiefly to Plotinus, does not consist only in the explicit recognition of what is involved in the notion of Consciousness, but this may be singled out (as by Prof. Siebeck in his special chapter) for particular notice because of its critical importance. That the notion should first have been apprehended in its full import by thinkers who were revolting, under ethical and religious motives, from a naturalism that had passed into materialism, and who were ready to sacrifice everything for the restored sense of inwardness, is not surprising. The earlier revulsion of Socrates from a less developed form of naturalism, though similarly motived, led to no such thorough-going assertion of conscious antithesis of mind to nature as was now wrung from the Neoplatonist puritans. Accordingly Plato and Aristotle, in spite of their developed psychology, have no general word to mark the attitude of the introspective observer, nor do they clearly recognise that synthetic activity which is the note of conscious mind alike for psychologist and philosopher. The fundamental deficiency was not likely to be made good in the following period when no advance, but rather the reverse, was made in general philosophical conception. Nevertheless when the time came for protest against the Post-Aristotelian naturalism, Plotinus and the Neoplatonists had the benefit of the increase of insight that had meanwhile been gained into the details of psychical experience. In Galen and several of the Stoics as well as Peripatetics, may be noted a distinct approach towards the various expressions in which Plotinus was able at last to characterise effectively the attitude of subjective reflexion upon the whole round of experience. The significance of the step lies in the fact that without such a conception of Consciousness as was then first attained (though not therefore immediately or indeed for long afterwards utilised), it is impossible to bring into view the *phenomenal* opposition of mind and things with which the scientific psychologist has to work.

The final section, devoted to the Christian rendering of ancient psychology, though it ranges over many centuries, from the second to the thirteenth, occupies not much more than 100 pp., for the good reason because there was no scientific advance through all that time to compare with what had been made within two or three centuries before. At first, Christian thought turned mainly upon the question of the nature of the soul, and, under the exigencies of appeal to the popular imagination in regard to a future life, there was a distinct recrudescence of the old materialistic dualism; until Augustin restored the cause of philosophic spiritualism while asserting the duality of men's nature, and fixed the main lines of orthodox animism from that time forth. But Augustin was also, in the more special sense, a psychologist of mark—the one original inquirer in the Patristic period, and his observations (on belief in relation to knowledge, on will and other mental processes), though always having a confessional motive, are such as to deserve all the attention that Prof. Siebeck accords them (pp. 381-97). In the Scholastic period, after an account of some more or less independent tentatives to develop psychological schemes in accordance with Christian needs—which, in as far as they were not independent, took colour from Plato—the historian has to note (in customary fashion) the gradual soaking-in of Aristotelian influence from the twelfth to the thirteenth century. When the saturation of the mediæval mind had become complete, he takes perhaps the most effective way of appreciating the result—in a detailed exposition of the psychological system of Thomas (pp. 448-72).

How far all the various lines of Scholastic activity are brought sufficiently into view cannot be judged till in his next volume Prof. Siebeck traces those other currents within the Middle Age which are the true beginning, so far back, of the Modern movement in psychology. At present some thinkers are passed over, as Anselm and Abælard, who, though they may afterwards be noticed in connexion with the Nominalistic theory which they differently opposed, might have had their places assigned in the general development as thus far indicated. But, however this may be, nothing but thanks is due for the instructive presentation of the Aristotelian psychology in its Christian guise. The large comprehensiveness of the original doctrine, which brought mind into relation with life in general, was not lost upon such an intellect as that of Thomas; giving his psychological thought that disposition that enables the revived Scholasticism of these days—revived or at least re-awakened to militancy—still to present some kind of front to the most recent advances of science. Nor had the Christian discipline failed to direct attention to aspects of mental life which Aristotle had overlooked; so that now they received, upon Aristotelian lines, a systematic consideration as never before. The result is a body of psychological doctrine filled out and articulated to a hitherto unexampled degree. Yet it wants the vital spark that quickened the original Aristotelian system. Only at the higher stages of mental development had Aristotle been unable to carry through his scientific conception and been fain to have recourse to the external agency of νοῦς χωριστός; but just this foreign element was laid hold of by Thomas and made the means of transforming the whole doctrine in a dualistic sense. It was no longer a dualism of the old crude sort. The abstract thinking of Plato and of Augustin had done its work, and it was impossible any more to represent conscious mind as extended in an extended body. But equally impossible was it to understand how with body taken as absolutely extended conscious mind can be in such relations as it is—affected through body in sense, acting through it in volition, apprehending or, as it were, appropriating it in cognition. There was need, in short, for a radical change of base, if Aristotle's monistic thought was to be carried through or not abandoned altogether. In the light of the general conception of consciousness to which Aristotle had not attained, it had to become understood that the external world of matter, inclusive of the specially-organised body, in relation with which the psychical life proceeds, is not there otherwise than phenomenally; so that nothing hinders the assumption throughout of those determinable conditions of mental process and function whereon the possibility of psychology as science depends. This insight has been gradually acquired during later centuries, but that it was already within the Middle Age beginning to be rendered attainable is, we have seen, recognised by Prof. Siebeck in leaving over to the next part to come of his work more than one strain of inquiry that accompanied or closely followed upon the scholastic construction of Aristotle's doctrines to which the Catholic Church bound itself. His readers cannot but look with eagerness for the continuation of the History, and wish him strength for the completion of his arduous task.

SCOTTISH PHILOSOPHY.[1]

Mr. A. J. Balfour's public-spirited act in endowing (for three years) a philosophical lectureship in the University of Edinburgh has here borne excellent first fruits. In the university of Stewart and Hamilton, no subject could have been better chosen for the initial course of lectures than a comparison of the Scottish, and more especially of their master Reid's, answer to Hume with that German one which in later days has forced the other almost out of hearing. Prof. Seth has done a good work in bringing fairly into view, without exaggerating, Reid's merits, and he has also been able, within his limits, to give marked effect to the founder's desire that " the lectures should be a contribution to philosophy and not merely to the history of systems". As an express effort to bring directly face to face the opposed philosophical schools of the present day, the lectures are specially welcome. They are, as usual with the author, very well written, and show him not less anxious than ever to understand and allow for the point of view of those from whom he differs.

As Reid set out—even more expressly than Kant—to answer Hume, and saw in Hume the natural term of that movement of modern philosophy which had been started by Descartes and had received a new direction from Locke, the first third of the course of six lectures is occupied with a review of the " Philosophical Presuppositions " which Hume took from his predecessors and of the "Philosophical Scepticism" into which—not partially, like Berkeley before him, but completely —he ran them out. In the next two lectures, Reid's own doctrine—especially of Sensation and Perception, upon which he spent his strength—is considered, and his deficiency of philosophical system gives the occasion of passage to the Kantian "Answer" which at least was free from shortcoming in that respect. Shortcomings enough appear, however, arising from Kant's readiness to make admissions to Hume which the wiser Reid had withheld; and the last third of the course is occupied first with an exposure of the particular superstition of "Relativity of Knowledge" which Kant imposed upon his adherents, including Hamilton within the Scottish school itself, and then with a consideration of the help towards philosophical system that may be had by the truer heirs of Reid's saving common-sense from Kant's profounder successor, Hegel, whose "analysis of the conceptions of reason as reason" is pronounced "an indefinite advance on anything that had gone before it in modern philosophy".

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[1] A Comparison of the Scottish and German Answers to Hume. By Andrew Seth, M.A., Professor of Logic in the University College of South Wales and Monmouthshire. ("Balfour Philosophical Lectures," University of Edinburgh.) Edinburgh and London: W. Blackwood & Sons, 1885. Pp. xii., 218. (*Mind*, xi. 267.)

The account of Descartes and Locke, in the first lecture, is remarkably good. It would be impossible to bring out more clearly and succinctly the inability of the "two-substance" doctrine of the world to afford any explanation of perception or knowledge. This doctrine, with its mediating factor of "ideas," Locke took in all essentials from Descartes; and, if he had not done service otherwise to the philosophical theory of knowledge by giving the chief impulse to scientific psychological inquiry in modern times, his halting and wavering application of it must have kept him from ever winning any place of importance in the history of philosophical thought. Berkeley is lightly passed over in the transition (made in the second lecture) to Hume,—on the just ground that Hume, while drawing directly from Locke the principles that he carried out to the fateful results, received at most from the younger thinker mere aid and suggestion; but something might have been said of the positive advance upon Locke that Berkeley did not fail to make in point of psychological theory, recognised as this was not more by Hume than by Reid himself. And, apart from any concern of Reid, the like omission is to be observed in the handling of Hume. While Prof. Seth brings out in a most effective way the negative, or at least purely sceptical, character of Hume's ultimate results, and argues with reason against a late attempt to represent him simply as a constructive philosopher, acknowledgment might still have been made of the serious purpose with which, as the Introduction to the *Treatise of Human Nature* shows, he set himself to the task of bringing the "science of man," after Locke, into some kind of line with the physical science of Newton and others. Nor even as a general philosopher, in respect of that part of the philosophic function which his champion Prof. Huxley had not least in view, *viz.*, the providing of a theory or explanation of the special sciences, can it be said that Hume is devoid of all constructive aim. Opinions may differ as to the sufficiency of his theory of physical, still more of mathematical, science; but if we are to take him, as Prof. Seth desires (p. 70), "at his own valuation,"—not only again in the Introduction but throughout many chapters in the body of the *Treatise*,—we may hardly deny that, in the uncertain mixture of his intellectual temperament, there was after all a considerable dash of the genuine positive spirit.

Reid's great merit, on the question of perception, is declared to be his clear insight (in general) into the impossibility of giving any explanation of that function from an assumption of unrelated sensations, to be afterwards brought, by one means or another, into relation. Prof. Seth thinks that the most advanced psychologists of the present day have been driven, practically, to the same position, which he would himself express in the form that, though indeed "sensation is the condition of perception," "sensation as sensation does not enter into perception at all" (p. 93). Here we need not follow him into what he finds well—or again not quite well—said by Reid, but may remark that, in seeking to apply the modern psychological doctrine of "local signs" against a vain distinction made by Reid between the cases of visible and tangible extension, he gives it first, on pp. 90-1, some rather questionable expression, and then is led on to use language about both visual and tactile sensations—that they "must contain some specific indication or hints as to the whereabouts of the object if our location of the latter is not to be purely arbitrary"—which does not seem to consist very well with the denial (just quoted from next page) to "sensation as sensation" of any import for perception. That denial is, surely, much too absolutely made. It is plain that in the philosophical analysis of objective perception (or percepts) any elements of sensation that are disclosed must appear as ordered or related in manifold fashion, as also that, even for the individual, any the simplest actual sensation must already figure as part of a general system of experience; but it seems not less plain that from another point of view—which is the properly psychological one—sensations may and (for purposes of science) must be regarded as unrelated. The organs of the different senses, though all physically connected through the one nervous system, have a relative independence, and may in different degrees be called separately, or when not separately then at least distinguishably, into play. While passive sensations like light and sound can be had to all intents and purposes wholly apart, it is possible also to get at the elements of what appears, at first, as a unitary sense-experience of the active sort (touch, vision, &c.)—because the co-efficients (of passive sensation and so-called muscular sense) may be made to vary relatively to one another. Now, unless it be maintained consistently that the psychological investigation of the various kinds of sense-experience has no bearing at all upon a theory of objective perception, there can be no ground for complaint that they are viewed, in the first instance, as far as possible, in isolation. From this ground, we have seen, even Prof. Seth cuts himself off; still more Reid, who never desired to make any distinction between philosophy and psychology (such as is now from any point of view seen to be necessary), while he was most earnest in his wish to proceed upon a psychological basis. Reid might therefore very well have gone much farther than he did in the way of such (psychological) assertion as Prof. Seth shakes his head over at p. 88. He was safe enough against thinking (with Hume) that any manipulation of psychological factors, as such, could of itself, straightway, account for a knowledge of object.

The want of system in Reid's statement and description of the principles of knowledge is brought clearly into view; at the same time, nothing is passed over that may help to recover for him the philosophic character which it has been the fashion to deny him since the time of Kant, or since

Kant's depreciatory opinion of him became known. Specially interesting, in this connexion, is the reference to the various passages in the *Intellectual Powers*, where Reid seeks in the forms of language a clue—or more than such a mere "clue" as Kant, in corresponding case, sought from the school-logic—to the principles, as he called them, of "common-sense". When the function of language in producing and maintaining community of knowledge among men is once considered, its philosophical import is seen to be of the most profound and far-reaching character; and Reid, with his "common-sense," is to be blamed only for allowing the more important use of the word "common" to be overshadowed by its other implication of 'ordinary' (as having relation to everyday experience and practice). In making what reference he did to language, he shadowed forth a surer method of philosophical analysis than Kant, with all *his* more laboured art, was able to devise.

Kant—not for the first time—gets somewhat hard measure from Prof. Seth. However ready to acknowledge his large manner in comparison with Reid's, the lecturer is no sooner embarked upon an examination of the Critical Philosophy than he finds (like Dr. Hutchison Stirling) so much to except to in its fundamental positions as to side rather, in the end, by preference with the modest Philosophy of Common-sense. Though refusing to accept the home-grown product under its name of Natural Dualism (which, of course, brings back the "two-substance theory" in an aggravated form), he has, apparently, little or no objection to it under its other guise of Natural Realism. On the other hand, Kant's categories are, after some consideration, pronounced "useless because they simply do over again what is already sufficiently done in the objects themselves" (p. 140); as, again, it is claimed for Experience that, so far from being identifiable with mere sensation or contingency, it "yields to the knower objects and relations of objects which are, to begin with, just what the categories are supposed afterwards to make them" (p. 142). Later on, in the fifth lecture, the Scottish philosophy is expressly congratulated upon its escape from the dangers of Kant's subjectivism "by taking up the broad position that while the principles in question [pure percepts of space and time and categories] are referable to the constitution of our nature, our nature is, in respect of them, in complete harmony with the nature of things" (p. 157). And even in comparison with the method and achievement of Hegel, it is suggested, in the last lecture of all, that the Scottish procedure may yet lead to a more satisfactory determination of the ultimate questions of human concern. This suggestion is to receive further development in the coming second course of lectures, which may also give the best occasion for considering what is here said on the help to be meanwhile sought from Hegel towards that end; but as between Kant, on the one hand, and Reid, with the truer upholders (than Hamilton) of the Scottish tradition—"writers like Prof. Calderwood, Prof. Flint and Dr. M'Cosh of Princeton" (p. 183)—on the other, it may be asked whether the making of such round assertions about reality, object and the like, as data of direct experience, does not come perilously near to abandoning the philosophic task altogether. Prof. Seth, like Reid before him, makes no difficulty about surrendering the secondary qualities of matter to the relativist, let straightforward experience say of them what it likes, but would draw the line, for perception, at Aristotle's 'common sensibles,' and speaks of these as an absolute directly apprehensible by "reason in sense" (p. 154). Why, though 'common,' should they have an absolute objective character ascribed to them as against Kant's subjectivist interpretation, which at least explains how they can be—as they have to be—combined in perception with the 'special sensibles,' allowed to be subjective? Or—giving the question an expressly, instead of (with Kant) an implicitly, psychological form—why should they not be referred to an origin which, while distinctly marking them off from the varying 'special sensibles' with which they are interfused, explains what variability there yet is to be found in our apprehension of themselves? The psychologists and Kant, from their different positions, have then, indeed, a serious enough task before them to explain what we all mean by object; but the work of philosophy is serious—more serious than Reid, at least, ever quite imagined, once he was frightened back by Hume from that 'doctrine of Ideas' which (he tells us himself) he once believed so firmly as to embrace the whole of Berkeley's system along with it.

Apart from some questionable arguing upon the line here suggested, there is a great deal of sound and seasonable doctrine in the lecture on "The Relativity of Knowledge". It bears with telling effect against the relativism of Kant and Hamilton, and only does not seem to touch the Phenomenalists proper who are here too indiscriminately ranged with the Relativists over against the more "fortunate" Natural Realists of unadulterated Scottish breed. Indeed, Prof. Seth himself may be thought to reason with no small force in support of a pure phenomenalism from p. 167 onwards.[1] However that be, enough should have been said to draw attention to these Balfour Lectures. The second series will be neglected by no reader of the first.

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[1] Is Prof. Seth quite just to Locke at p. 169, when, after quoting a sentence from the *Essay*, he in the next sentence changes Locke's "*ideas* of particular things" into "proper names"?

PSYCHOLOGY.[1]

THIS book is one of the welcome signs from America of a strong forward movement in psychology now in progress there. The large number of psychological and psychophysical contributions to *Mind* that have come from over the Atlantic in recent years; the announcement that an *American Journal of Psychology* is henceforth to be added to the list of scientific periodicals in which the abounding energy of the young Johns Hopkins University of Baltimore seeks a vent; the appearance of a work of the size and comprehensiveness of Prof. G. T. Ladd's *Physiological Psychology*, mentioned elsewhere in the present number and claiming the detailed appreciation that will follow,—are other evidences, to which more might be added, of the same fact. It is significant, too, that the very object of Prof. Dewey's book is to help in getting "scientific psychology" set before the students of American colleges, instead of that "compound of logic, ethics and metaphysics, mingled with extracts from the history of philosophy"—as he calls it—which it has been usual in the past to serve up for them, in connexion with some tags of psychological theory from Reid and Hamilton. Some years ago in *Mind* (iv. 89-105) a very effective description was given of the kind of elementary philosophical instruction so widely diffused through the United States by the host of colleges, mostly denominational. If the present manual of psychology finds its way into general use among American students, it will not leave things as they were.

A manual of psychology, it is still expressly written as an introduction to the study of philosophy in general. Not only is Prof. Dewey of opinion that it is impossible to exclude from the science a reference to the philosophical principles it involves, but he has, as readers of this Review have been made well aware, very decided views on the quite special relation that subsists between psychology and philosophy. He finds it possible to reconcile an idealism of the thoroughgoing modern type, first developed in Germany, with an adoption of the spirit and aims of the English psychological school from Locke onwards. It has been interesting to hear such ungrudging allowance of philosophical import to the work of the English inquirers from one who speaks the language of a class of thinkers with whom it has been a common fashion to regard it with a certain disdain. Somewhat more certainly, however, than Mr. Sh. Hodgson, from his independent standing-ground, could (in *Mind*, No. 44) impeach the validity of the attempt to bring about an alliance between German transcendentalism and empirical psychology, may it be doubted whether those who make a first beginning of study under Prof. Dewey's guidance will be able to grasp the peculiar philosophical speech which he is apt to employ in the midst of his psychological exposition. To be told, for example, at p. 6, that "Psychology is the science of the reproduction of some universal content or existence, whether of knowledge or action, in the form of individual, unsharable consciousness," may prove a hard hearing, even when the student is comforted, at p. 157, with the assurance that he will "see more clearly what is meant" thereby after taking in such a statement as the following: "The knowledge of the finite individual is the process by which the individual reproduces the universal mind, and hence makes real for himself the universe, which is eternally real for the complete, absolutely universal intelligence, since involved in its self-objectifying activity of knowledge". The author also has a way at times of resorting to a kind of kaleidoscopic play with antitheses, which tend to pass over into one another in a manner more dazzling than edifying. There is a notable instance at p. 153, where Apperception and Retention are given as the "two sides of the process of knowledge"—the one accounting for the world as it "comes to exist for us," the other for the self as it "comes to exist as real". The antithetic statements that follow in rapid series through half a page get mixed up in a way that leaves one with no very clear notion of what it is that Prof. Dewey thinks is done for the world by self or for self by the world, how in his view it all comes about, and what that world and self are that he so sets in face of one another. The philosophy involved does not seem to do much for the beginner in this case or in others like it.

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[1] By JOHN DEWEY, Ph.D., Assistant Professor of Philosophy in Michigan University. New York: Harper & Brothers. Pp. 427. (*Mind*, xii. 439.)

It would, however, be giving a very false impression of the character of this text-book to dwell longer on the features yet mentioned. As a purely psychological treatise—implying philosophical principles and portending philosophical issues, but not necessarily to be used for enforcing particular philosophical conclusions—it has great and obvious merits. While Knowledge has the inevitable precedence and prominence (pp. 27-245), a distinct stand has evidently been made for something like a fairly balanced consideration of the two other phases of mind. Feeling, especially, within the hundred pages given to the topic, has received an adequate handling. Feeling and Will have, besides, their part in two chapters of general introduction, as again, to some extent, in the account of Sensation (pp. 27-80) with which "Knowledge" begins. Nothing, indeed, could be better than the whole general view that is given of the relation of the three phases to one another, except when the disposition to merge and dissolve, in dialectic strain, begins to assert itself for the behoof of Will as "the complete activity," "self," "man," or what not, wherein the opposition of Knowledge and Feeling becomes reconciled. The misfortune of such reconciliation is that the "Will" so construed does nothing to remove the need of still treating Will as a distinguishable mental phase among the others: and the double sense is confusing.

The account taken of Sensation gives perhaps the simplest measure of the book's quality. The main results of recent inquiry about the Senses are well and clearly expounded, and they are set out in a connexion which makes them thoroughly serviceable for one psychological purpose at least. Prof. Dewey has a very distinct notion of the difference between the actual facts or events of mental life and the scientific abstractions by means of which it is sought to comprehend them. Accordingly he distinguishes with excellent effect, under the head Knowledge, the three topics of "Elements," "Processes" and "Stages". The "Stages" —Perception, Memory, Imagination, Thinking, Intuition— are taken last, as representing, so far as is scientifically possible, what actually goes on in the way of cognition ; the order here again being determined by the view that there is a certain abstractness in all the others till in "Intuition" the fulness of knowledge—"knowledge of an individual"— is reached. Between "Processes" and "Elements" the psychological problem of Knowledge is aptly conceived as that of the elaboration of sensations "on the one hand into the objects known, and on the other into the subject knowing" (p. 81), or (p. 84) their transformation into a "world of objects, relations and ideals" and into "the self which knows and idealises". Sensations are, thus, clearly of account for Knowledge as elements, to be worked up by the processes which Prof. Dewey finds to be—respectively for world and self—Apperception (with Association, Dissociation, Attention, as its "kinds") and Retention. But in the earlier introductory section (p. 25) it had been laid down that also the general problem of Psychology was none other than to understand how a raw "material" became worked up by certain "processes" into "results"—described as "the concrete forms of consciousness, the actual ideas, emotions and volitions". Now the raw material is in all cases alike of a sensuous character ; at least, it is with none other than sensuous states that the exposition of Feeling and Will, as well as of Knowledge, is made to begin. But, whereas the general scheme of treatment, from elements through processes to results, is, as we have seen, effectively carried through in the case of Knowledge, there is no attempt to maintain it for the other phases of Mind ; the whole exposition in their case resolving itself into a description (for Feeling, as already said, a very good one) of what, in Prof. Dewey's language, may be called either "stages" or "results". There is, of course, a good reason for this, though it does not appear to be anywhere explicitly stated. It is that "processes" certainly, and "elements" in the main, have once for all been sufficiently disposed of under the first head of Knowledge. This, however, amounts to saying that the account of elements and processes is of general psychological import, and is best presented in one division apart of General Psychology, as in the scheme of treatment which Prof. Clark Murray in his *Handbook* (see *Mind*, x. 611, xi. 25) has the credit of first giving currency to in English. Prof. Dewey could, with mere trifling changes of detail, have so set apart his chapter on Sensation, with that on the general principles of mental synthesis which he calls "Processes of Knowledge"; and the gain in expository clearness would, I think, have been undeniable.

There are many points of doctrine set forth in the book which, if space permitted, there would be pleasure as well as profit in examining at close quarters. Whether one agrees or not with the author, it is impossible not to recognise his freshness and independence of view and telling vigour of statement. In particular, his analysis of the "Processes of Knowledge," involving his account of Association, Attention and other topics now so much to the front, may be commended to the notice of psychological workers. One aspect of Knowledge, as it happens, is treated by him in the present number (47) of *Mind* at greater length than was possible in the text-book, and a ready opportunity is thus afforded of gauging his manner of thinking on the subject. While in close touch with all the later German and English work in psychology, he is here no simple repeater of other men's doctrine. With even more independence of gait, there is manifest the like intimacy with the best recent inquiry in the very interesting chapters on the upward "Stages" of knowledge. Nor at another point, it may also be remarked, does his exposition come all too short of what in present circumstances may fairly be expected—I mean the reference to physiological conditions. At first, indeed, it seems as if he were ready to go very far in appeal to these. He does not hesitate to lay it down (p. 8) that the Introspective Method fails even to classify the facts of consciousness, much more to explain them: explanation must be sought first of all from the Experimental Method (in physiological psychology), and next, more completely, from the Comparative Method in its various applications. Accordingly, he refers freely enough to neurological facts at the stage of sensation, and even includes some short account of psychophysical procedure. It is very well; but, if students are to profit by such reference, it would seem necessary, in a text-book, to give, once for all, however shortly, a clear and distinct view of the relation of nervous to mental process and a summary of the really important and relevant physiological data. Prof. Bain's example in this matter was worthy of closer imitation than it has received in any of the later manuals for students. It is easy of course, and in a way creditable, to protest against an infusion of physiological smatterings; it is also conceivable that a complete psychological theory, including even a doctrine of sensation, might be worked out without physiological references. But, in point of fact, nobody thinks of working out any such theory; and, as everybody does import just as much physiological statement as is found necessary or possible or, it may be, convenient, the plain course is to do it with sufficient warning and explanation from the beginning. Prof. Dewey does not do enough in this way for the help of students. Learners, at least if left to themselves with his book, would, I imagine, find it hard enough to connect with his introductory view of Mind in general the doctrine of Sense to which they find themselves straightway conveyed; and I say this without ignoring the section soon inserted on "Relation of the Physical Factor to the Psychical". (In this, by the way, should not "Psychological Objection," at p. 41, be called Metaphysical rather?)

On the general question of psychological explanation, I close with the remark, that if it is to come only, as Prof. Dewey urges, by resort to the Physiological—or more properly (in the wider sense of the word) Psychophysical—and Comparative Methods, there would need to be a good deal more both of psychophysical and of comparative statement forthcoming than he has anywhere provided in his book. Nobody could put more impressively than he does the helplessness of both methods apart from the data yielded by Introspection; and he has himself given throughout the work the best proof that the Introspective Method is by no means so helpless to explain as, at the one place before noted, he too incautiously avers. It should be added that every chapter is followed by a most useful conspectus of the related psychological literature.

THE SCIENCE OF THOUGHT.[1]

It is impossible not to admire the author's earnestness of purpose in this book, and not to envy him (a little) his sense of achievement. The purpose is high. It is nothing less than to "place all philosophy on a new basis" (p. 514), by drawing out a science of Thought from that science of Language which his own labours have done so much to advance. Having helped more than most men in tracking out the past history of the words in use among Aryan peoples, he is convinced that, "if we fully understood the whole growth of every word, philosophy would have and could have no longer any secrets"—nay, "would cease to exist" (p. 515). The consummation is not going to be reached just at once, but at least the right path is now opened which philosophers, even the greatest, have missed before. Let the lines he here traces be followed out, and "several more generations of scholars and philosophers" should at last see an end of the business.

This is a specimen of the fine cheery confidence which Prof. Müller is able to maintain throughout the work; but yet he has also another mood. *Dixi et salvavi meam animam* is the exclamation wrung from him at thought of the degenerate age upon which he has fallen with his philosophical plea. Indeed, at starting, he declares it is only for himself and "a few friends," fellow-travellers with him for many years on the same road, that he writes at all. So, now and again, it is borne in upon him what an arduous and toilsome course that is along which he has to drag the "patient reader"—if (p. 548) perchance he has a reader! It is an odd imagination. The age is, of course, not in the least degenerate; and how could he fail to have readers as he wanders with that perfect gaiety of heart from topic to topic, putting his whole self into everything he says—and this a self so kindly that he can never meet a foe who is not straightway made to assume the guise of a friend and ally? He has written the most genial and readable of books; but, certainly, if for "reader" he had said reviewer, no pity he had to spare could be too much. The discursiveness of the work is something extraordinary, and there is toil indeed for one who will try to reckon up its sum. Nevertheless, let the trial be made.

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[1] By F. MAX MÜLLER. London: Longmans, Green, & Co., 1887. Pp. xxiv., 664. (*Mind*, xiii. 94.)

The backbone of the book is to be found in some chapters, beginning with ch. v., from p. 179. In ch. i. the original start is made naturally enough with an analysis of Thought into its "Constituent Elements," but this runs down about p. 30 (not without considerable digression by the way); and the long remainder of the chapter, occupied mainly with a general discussion of the dependence of Thought upon Language, still more the next three chapters, are intended only to clear the way for the more serious business begun in ch. v. If the preliminary matter—consisting, beyond what has been already mentioned, of an argument for the impossibility of supposing the Language of Thought in man to be related to or evolved from the inarticulate cries of the lower animals—runs to the length of 178 pp., the reason is not least because the author has so much personal reminiscence of past dealings with the subjects to give way to. To be sure, there is included in this introductory part of the work a chapter "On Kant's Philosophy" (pp. 127-51): but neither is this without relation to past achievement. At last fairly under weigh from ch. v., Prof. Müller furnishes the complement to his initial view of the constituent elements of Thought in an analysis of Language—at least Aryan language—down to roots, which for the most part prove to be of conceptual import. Ch. vi. (pp. 256-330) is then devoted to a theory of the origin of Concepts and Roots together, which he has been led to form with the help—if not under the lead—of his friend Prof. Noiré of Mainz. Next follows a long chapter in which an examination (after the old Indian grammarians) of Sanskrit roots is found to confirm the theory that it was in putting forth repeated actions together that men first *spoke* with mutual intelligence; yielding as final result a scheme of conscious human activities that may be taken to represent the *idées mères* of the Aryan race, or at least of the Indian people. All that then seems to Prof. Müller strictly necessary for the fulfilment of his purpose of placing philosophy upon the new basis is supplied in one other chapter on the "Formation of Words" (pp. 420-518); in which he shows how roots became transformed by the "application of categories," works out (in controversy chiefly with Mill) what he considers a true scheme of Logical Terms, and enlarges on the function of Metaphor in the development of speech. A further chapter on "Propositions and Syllogisms," thrown in as a superfluity, is in fact no serious makeweight; and the long "Conclusion" (pp. 548-618) neither adds anything new to the argument of the book nor even serves to bring threads together, but simply discourses further on-and-on or about-and-about.

A "Science of Thought" of which these are the stages is pretty evidently the work of one who is above all a scholar, and the book may more fairly be regarded and judged as the author's latest product in Linguistic than as an essay in Philosophy. That, of course, is not at all his own opinion; for not only is the book expressly given out as a philosophical theory of Reason, but there is promise of its being followed by a crowning philosophical effort, in which, under the name of "Science of Mythology," the fact of self-consciousness, now simply assumed, will have its full mystery probed, and the relation of the Many to the One—the fundamental question of all philosophy—will be determined. Nor, certainly, is it now for the first time that our author's interest in philosophy becomes known. A few years ago, it will be remembered, he carried through no less serious a labour than the translation of Kant's chief work (see *Mind*, vii. 277); and, already some twenty years earlier, the old *Lectures on the Science of Language* showed him alive to questions for which the common linguistic inquirer has little care. Indeed, when he now contends for a far more intimate relation of Thought and Language than he finds to be asserted by the majority of philosophers, he but develops an argument conducted on similar lines in the second series of *Lectures* (1864). Nevertheless, and in spite of the ambitious purpose now proclaimed, it may appear, upon a short review of his main deliverances (taken as far as possible in order), that the strenuous worker at Science of Language still advances but a little way beyond his old position of philosophical amateur.

The analysis of Thought proposed in ch. i. (pp. 1-76) fails chiefly in not being carried far enough. Prof. Müller has learned from Kant the great lesson that, while sensations come into consciousness only as percepts, percepts have definiteness only as they are conceptually understood; but the "constituents" of Thought would seem to need a good deal more particular determination for a "science" of it. Though Concepts have Names in a special relation with them, this is no sufficient reason why the fact should no sooner be noted than all further analysis is forgotten, throughout the body of the chapter, in the ardour of proving conception impossible without speech,—until, towards the end, some crude metaphysical explanation of Thought is supplementarily hazarded in terms of "impacts" received by a "self-conscious Monon" from "other Mona". Ch. ii., with "Thought and Language" for its declared subject, might have seemed the natural place for the proof foisted into ch. i., instead of being itself allowed to turn into something not at all indicated in the title—an argument against Darwinism. But, given the author his way, with all its sudden breaks and turnings, his constituents of thought, as far as made out, call for at least one remark. However involved with concepts, surely it is not rightly said, as at p. 2 and more expressly at p. 20, that names are a fourth element of knowledge, related to concepts as concepts to percepts and percepts to sensations. On the one hand, this declaration appears to give to the concept an (at least relative) independence that can hardly be intended by so absolute a nominalist; on the other, it appears to give to the name the same subjective character as belongs to the other elements, thereby robbing it of all its psychological efficacy. Generally throughout ch. i. (as elsewhere), it must be added, the author has a way of playing fast and loose with psychological terms that does not bode well for the "Science" he would create.

The argument for the inseparability of Thought and Language, in which the analysis of thought so soon becomes lost, is urged partly in the form of a more extended criticism of the dicta of philosophers on the subject than the author had given in the old *Lectures*, partly in the form of express reply to objections made against the plea he had there urged. He nowhere appears to better advantage in the present book than when so replying. The objections that have ever been made against the position that, in as far as thought is general (and thought is essentially general), it has being in and through some kind of particular expression, overt or covert, betray a deficiency of psychological insight, and are very effectively met here. Less satisfactory is the author's criticism on the philosophers. It is a kind of criticism that could be made of value only by being rendered at once more orderly and more extensive. And when in certain thinkers, even of nominalist faith, there is noted some failure to recognise, or at least declare, the thorough-going implication of speech with thought, it does not appear to have been sufficiently considered whether such declaration, or even recognition, was not beside their philosophical purpose for the time being. The fact that Kant in particular says nothing (except, as has to be confessed, in his *Anthropologie*) about speech, and yet accomplishes a philosophical analysis of thought, the mere fringe of which (as detached in ch. iii.) is ample covering for the author all through his own undertaking, might have suggested to him serious doubt whether the psychological involution of speaking with thinking—never to be exaggerated in its closeness—has all the philosophical importance here claimed for it.

The other preliminary contention, begun unexpectedly in ch. ii., is, after the interpolated view of Kant's philosophy in ch. iii., resumed in ch. iv. under the imposing title of "Language the Barrier between Man and Beast". Prof. Müller is of opinion that he cannot safely pass to the study of human speech as it is expressive of thought unless he first proves that language in man has nothing in common with the cry of the brute; and this, he imagines, can be done only by the overthrow of Darwin's doctrine of the descent of man from non-human ancestors. Not that, in his own view, man is not also animal, subject to all the conditions (properly understood) of evolution. He has no doubt that there was a time when man, approximately in present form, did not yet speak, as there was a still earlier time during which an indefinite series of previous stages were being passed through before the recognised human form was reached; still, in whatever lower guise and while not yet speaking, the man-to-be was the only animal destined to speak (and think). And as no animal off the particular line of human development—descended, that is, from any other primitive germ than the one appointed to grow into speaking man—can ever become man, so it is vain, with Darwin and others, to look for the origin or explanation of speech in any sounds that brutes can utter. Such, as well as can be gathered from a discourse that more than rambles and that bristles in detail with points of questionable statement (here perforce left aside), is the heart of his contention. The obvious reflexion upon it, as it stands, is that it appears to remain beset with all the difficulties it aims at avoiding. If 'man' not yet speaking, in whatever earlier form, was to all intents and purposes, or at any rate in effect, an animal like others, then at least one kind of animal could acquire the speech it had not, and its speech when acquired cannot be supposed unrelated to whatever simpler means of expression it had before it could speak. Doubtless, human speech is the outcome of no animal sounds (in apes or other creatures) of which we have present experience, so that, but in the way of illustration of that which went before speech (proper) in evolving man, such sounds are not to be drawn into account; but, if it must have had an origin which, though other, was still animal, then to talk of "barrier between man and beast" is mere rhetoric. Or, if the stress of the contention is meant to lie in a difference between feeling which brute cries express and thought which can only be spoken, this makes thought the true barrier; but the question then arises whether thought is so far removed from any kind of animal apprehension that it must have one particular line of organic evolution appointed for it from the first; and, even if this could be proved, the difficulty recurs that the line is after all a line of animals, thoughtless like any other till thought starts out at last within it. We shall see, too, before long that the author is by no means so sure that there was nothing that could be called speech in man before man thought-in-speech; forgetting, apparently, how fixed and fast was the "barrier" he had sought to raise for behoof of human reason. But what has rather to be said of the long argumentation with Darwin and the Darwinians is that it appears to be so much waste, thrust in where it is here. Let it be granted that it is only as man thinks that he (properly) speaks, and that in man himself, as in "the beast," vocal expression of mere feeling is not speech proper. It is an important question, for anthropologist or psychologist, when and how men came so to think-and-speak,—unless we suppose (as the author emphatically does not) that they thought-and-spoke always; but its settlement need in no way interfere with any conclusions to be drawn as to the constitution of man's thought from his actual speech. If such a "Science of Thought" was the author's real aim, one does not see what occasion there was for him to take all that trouble about his "rear" (p. 180). Less haste to be done with the analysis of Thought undertaken at the beginning would seem to have been more to the purpose. Be that as it may, however, let us now follow him, as, with mind relieved from all backward fear, he, in ch. v., buckles to—or resumes—his appointed task.

"The Constituent Elements of Language," which it here becomes his first business to discover, are not made out in any systematic fashion. Some representative specimens of Roots are obtained by comparison of other Aryan tongues with Sanskrit, which displays the common radical elements with greatest evidence: for the rest, he is content to fight over again, in episodic fashion, the old battle with 'bow-wow'-ists and 'pooh-pooh'-ists. But, towards the end of the chapter, he passes into a line of exposition (or remark) that has more significance, in respect at least of the admissions it involves. (1) He had formerly supposed that simpler roots are the more primitive, but is now convinced that "to postulate in the beginning simple roots with the most general meanings as previous to complex roots with more special meanings would be the same mistake in linguistic history as in natural history to claim for the genus a priority before the species, or for the species before the individual" (p. 220). Without pausing to remark upon the force or aptness of his simile (more especially as coming from one who argues about "species" as he does in ch. ii.), there is here a remarkable approach by an adherent of the school of Bopp to the position of later inquirers who do not find that the problem of language is to be solved in accordance with any single principle of logical development. (2) An equally or still more remarkable allowance appears in the declaration that, while two classes of roots are to be signalised, *predicative* and *demonstrative*, the demonstrative "in their primitive form and intention are addressed to the senses rather than the intellect" (p. 221); and that, though it would simplify the problem of language to suppose, with Bopp and his school, that all roots are conceptual, we may, in the demonstrative elements, be having to do with "remnants of an earlier stage, if not of language, yet of communication" (p. 222)—"of the earliest and almost pantomimic phase of language in which language was hardly as yet what we mean by language, namely *logos*, a gathering, but only a pointing" (p. 241). The allowance could not be more frankly made, and one misses only some recognition, here or anywhere, of its bearing upon the contention, so vehemently urged, for the eternal "barrier" between man and brute. If human language had to pass through such an earlier phase—whether then to be called "language" (as we now understand this) or not—there does not seem to be much left in the way of barrier. At the same time, one may suggest a doubt whether Prof. Müller does not suffer his candour to carry him too far in the way of allowance. For supposing "language" were at first "a pointing" merely, would it therefore be devoid of all conceptual import, as he seems here to imply? Surely, it might still be—nay is to be—maintained that, since even the spoken word is "addressed to the senses" and could not otherwise do its intellectual work, the earlier and ruder pantomimic gesture already had a properly intellectual character. Farewell, else, to all possibility of establishing the indefeasible relation between Language and Thought. (3) Our author, finally, is quite willing (p. 245) to go all lengths with those who maintain—as, he reminds them, already Aristotle saw—that the unit of language is the sentence rather than the word, or, if word, such word as is nothing less than sentence; having no difficulty in supposing that the bare root (prior to the formed word) should have had from the first all the force and significance of a sentence, imperative or other. This is very well; but then it might have occurred to him, in proceeding next to study the "Origin of Concepts and Roots" together in ch. vi., that the initial analysis of Thought never got beyond the point of eliciting the "Concept" in that most special sense in which it is related to the fully developed "Name". The perfunctory character of the work done at that all-important stage becomes more and more apparent.

In point of fact, "Concept" does now, when it has to be connected with "Root" instead of "Name," have its import tacitly widened by Prof. Müller; though, in beginning ch. vi. with an historical excursus on the views of English philosophers from Locke onwards as to the abstract (general) idea, he is still concerned with this in its more definite sense, as related to the "Name". The excursus must not detain us, but let it be said in passing that it exhibits a looseness of statement only too characteristic of the author's historical references throughout. For example, though making always a great deal of Berkeley—"dear Bishop Berkeley" as at last (p. 617) he fondly calls him—he is here (pp. 259 ff.) so little careful to note the exact point of the bishop's doctrine, which puts no stress upon the "name" in explaining the "abstract idea" (so far as Berkeley will allow of this at all), that he is found quoting as if from Berkeley himself well-known phrases of Hume's that quite misrepresent it.[1] Coming to the heart of the chapter, we have a sympathetic, even enthusiastic, exposition of Noiré's theory of the origin of roots, prefaced by or including a lengthy statement of that writer's general philosophical method and conclusions. So far as this second digression is again historical, Prof.

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[1] The true gist of Berkeley's doctrine, which (probably owing to Hume's misrepresentation in *Treatise of Human Nature*, i. 1, § 5) has too often been missed, was noted in *Mind*, iii. 386, on occasion of Dr. A. Meinong's admirable statement of it in his *Hume-Studien*, i. (See above, p. 363.)

Müller might well have spared it to his readers, having before overladen his translation of Kant's *Kritik* with such a dead weight of 'Introduction' in that kind from his friend; nor can gratitude be professed for the metaphysical part of it, so little helpful to the business in hand. It is more to the point when he goes on to tell how Noiré himself held a view of the origin of speech allied to that of Darwin and the common evolutionist school, before, in 1877, he committed himself in his *Ursprung der Sprache* to the definite position that men's first articulate utterances emerged on occasion of their putting forth some conscious activity in common. The fact that the action (as of grinding, weaving, or what not) was a repeated one lent to the utterance a conceptual character, inasmuch as the utterance was a means of giving unity to a multiplicity; and the fact of its emerging, under common conditions of organisation, from a number of throats together, made it at once significant for purposes of intercommunication. Our author had himself been so far on the way to some such view as this that he was prepared to accept it as soon as formulated by Noiré, subject to its proving comprehensive enough to cover all the facts. In particular, he had a difficulty in seeing what relation there was between human activities, supposed to be thus so naturally expressible in sounds, and the visible or other sensible qualities of things, which men had had no difficulty in naming. The difficulty vanished on closer examination, because it appeared that the names of colours, &c., when sufficiently analysed, had roots themselves expressive of some human activity (*e.g.*, Sk. 'varna,' colour, being from a root which means to 'cover'). Yet, while giving in his adhesion to Noiré's theory in general, he is still constrained to allow (as Noiré does not) that a certain number of roots may have had other origin. Roots that are expressive of natural sounds may very well, he thinks, have arisen by way of imitation, *i.e.*, onomatopoetically; and even where human activity is involved, as in the process of grinding, he is not sure that the original root expressing the act may not be an imitation of the sound resulting from the act rather than (as Noiré contends) the direct accompaniment of the act itself. These are, again, notable admissions, which might well have suggested to the author a less uncompromising tone in his preliminary contention with the Darwinian evolutionists. But, to let that pass, there is nothing but praise due to him for the spirit, and in general also for the matter, of all these later parts of ch. vi. They show him superior to the weakness of supposing that the origin of language, in all its multitudinous stages and varieties, is to be straightway solved by any single sweeping theory. At the same time he does very well to make as much as he can of Noiré's luminous idea. There is evident truth in the position that, as nothing is more natural than for men to act and to act in common, so it is on occasion of general bodily work that the special activity of throat and tongue will most readily be called into play. The real nerve, however, of Noiré's theory as explanatory of the phenomenon of conscious speech may be held to lie in that part of it which is not peculiar (if any part of it *is* quite peculiar) to himself, but which he has in common with all the more clear-sighted theorists about language within the present century. What turns any utterance into speech is not the fact of its arising upon this occasion or upon that—as the accompaniment of an overt activity rather than as the outcome of impressions passively received; but it is the fact that upon being sped it is taken up and thrown back upon the utterer by his kind. What the poet says of a jest, that its—

"prosperity lies in the ear
Of him that hears it, never on the tongue
Of him that makes it,"

is not less true of everything spoken. Language is an essentially social product, arising for practical purposes of communication between man and man, and only secondarily having an intellectual use for the individual thinker. Our author's reservations, in the act of adhering with such generous warmth to his friend's theory, may fairly be taken as declaratory to this more general effect.

The long chapter that next follows on "The Roots of Sanskrit" (pp. 331-419) need not long detain us, notwithstanding that its linguistic details in all their minuteness are intended to serve the purposes of the author's main argument. It is to be shown that the radical analysis of Sanskrit—assumed always to be that form of (Aryan) speech which not only retains distinctest traces of the manner of its original construction but also has on the whole the best title to seniority among its sister-forms—affords the exact verification that is wanted of the theoretic view, that men's first spoken utterances had reference to activities they consciously put forth in common. In the end, however, the author is himself not sure to what number of hundreds the thousand or so of roots that have been identified early or late by the labours of Sanskrit scholars must be brought down before the true ultimates, or rather primaries, are obtained; nor does he give as more than tentative a list of "The 121 Original Concepts"—"primitive social acts of primitive social men and states more or less closely related to such acts"—to which the few hundred roots gave more or less varied expression. It is, no doubt, an interesting historical fact to know—as far as may be known in this way—what ideas were chiefly in the heads of our Aryan ancestors. It is instructive also to be able to follow, so clearly and distinctly as appears to be possible in the case of Sanskrit roots, the kind of simple transformations whereby a small number of original elements can be made to serve the vast multitude of human needs and occasions of expression. We are not therefore brought even approximately face to face with the earliest efforts of human speech; though these, in general character, may have been of a kind not unrelated to that which is disclosed in the particular Aryan tongue that at once lends itself best to study and has thus far been studied with best effect. Still less do the "120 mother-ideas of the Indian intellect," even if we take their discovery to be as remarkable an achievement of the "Science of Thought" as the author claims (p. 419), seem to carry us any length at all towards settling the philosophical questions that beset the human mind.

Does he then accomplish more for philosophy proper in what remains? The important ch. viii., on "Formation of Words," joins on to some interesting pages at the end of ch. vi., just before the thread of the exposition (as far as thread can be traced) was broken for behoof of the special linguistic inquiry of ch. vii. It was there shown how easily and naturally a root expressive of some primitive conscious act could be made to assume the variety of *verbal* phases (distinguished as active, neutral, passive, active transitive), and especially how, by way of what the author calls "Fundamental Metaphor" (a subject which later on he takes up again and follows out at length, in an interesting manner, from p. 485), speech originally expressive of the subject's own acts or states can be rendered applicable to events and changes in the objective world. He now, in ch. viii., settles down expressly to the task of following out the transformation of roots into the words—more particularly nouns substantive and adjective—of actual speech. First we have some loose dissertation on the Categories of Aristotle and other thinkers, with the result that Aristotle's table is taken as an at least practically sufficient index to the principles governing the transformation. I make bold to call the dissertation loose because while little perception is shown of the issues involved in the various schemes of Categories propounded by different philosophers, the interpretation even of Aristotle's is curiously vague and uncertain. Instead of seeing that Aristotle might naturally, and did in fact, employ the word "category" to designate those *elements of predication*—whether subject or predicate—which he sought for by dissolving the tie of the proposition, he understands the word as meaning "predication" (p. 424), or again (p. 432) "kinds of predication,"—obviously confusing 'predicament' (category) now with 'predicate' and now with 'predicable'. Also, he will have it (p. 432) that the word manifests Aristotle's insight into the fact that all words were in the first instance sentences—which sentences then dwindled into words. This is a remarkable gloss upon Aristotle's deliverance, to which he had elsewhere (p. 245) rightly called attention, that the logician must start with the proposition as representing the unit of thought; but, passing this by, are we then told, as we might expect, the various forms of "sentence" which the different kinds of word first assumed, before the process of shrinkage set in? By no means. There is put forward instead, from p. 433, the different conception, that language arises according as roots, which are "abstract, never concrete," become predicated "of this or that"—a process that is straightway, alternatively, called "applying the category of *οὐσία* or substance to the roots" (cp. p. 441). The equivalence of the two expressions is not very apparent, but, however that may be, we gather from the first of them that the process consists in predicating the (abstract) root "of this or that,"—that is to say, "root" is predicate in the case. Pass then to p. 443, and we read: "The first category predicates substance, the second, third and fourth quality," &c. Here it is "category" that has become predicate. And what has now become of the (abstract) root? I must confess that, after every effort, expended the more freely here because here if anywhere the author is touching philosophical ground, I can make out no coherent result from all this Category-business of his. The illustrations he gives of substantive nouns as involving abstract conception no less than adjectives, or again of some primitive root as lending itself to most varied application with or even without the aid of suffixes, are all very well; but exactly how the (Aristotelian) categories determine the process of word-formation—this is what remains obscure and perplexed to the end, for all his manifold references to them. And, supposing they did—as, of course, they in another way, or other formative notions in place of them, do—govern the process, does not this involve a distinct admission on the author's part that, underlying all such questions of word-formation as he here seeks to grapple with, there is the properly philosophical question: What the fundamental principles of human thinking are? The study of Language may help to shed a supplementary light upon these; but when words themselves cannot be understood except in the light of the fundamental principles (expressed as "Categories" or what not), it is surely by another method, the method of subjective analysis as practised by Kant and Aristotle and philosophers generally, that the principles are to be determined.

The haphazard sequence of topics beyond the point to which we have thus far steadily pursued Prof. Müller on his track, makes it inexpedient, or hardly possible, to continue following him in the same fashion; and the more because his treatment now becomes so largely controversial. I refer not only to the "Conclusion" (ch. x.), in which he delivers himself, against Mill or others, on a variety of special philosophical questions, or to the remarks on (at least)

"Propositions" in ch. ix., but also to the discussion on Logical Terms, carried on chiefly with Mill, which occupies the remainder of ch. viii., till he expands towards the close on that subject of Metaphor which he had touched upon earlier, at the end of ch. vi.. The judgments, in the closing ch. x., on this or that question debated of late among philosophical thinkers show his keen interest in the topics of highest intellectual concern, but, though the deliverances have mixed up with them many a reference to Language, it rarely or never appears what real connexion the one line of observation has with the other. Before this general epilogue, which demonstrates nothing so much as the author's sweetness of controversial temper, is reached, the effort made, with a doctrine of Terms and Propositions (what is said on Syllogisms is of no account), to demonstrate the ground of philosophical vantage held by the linguistic student, is more systematic—without being more successful. I do not believe the logician exists who could profess himself helped, in his work of understanding the import of thought and regulating its exercise, by such distinction of Propositions as is here (in ch. ix.) hazarded with or without reference—for the reference has not even the merit of being steadily sustained—to the rudimentary forms of predication that may be imagined to have done duty for the awakening intelligence of the first generations of speaking men. And (in ch. viii.) let the reader examine the scheme, strangely entitled of "Roots or Concepts," which, at p. 475, after his detailed criticism of Mill's account of Names, the author propounds as that better, nay "best," classification of words for logical purposes "which is supplied by the history of language". The scheme is strangely called one of "Roots or Concepts" when, whether conceptual or no, it is a question of the Words or Names into which Roots have passed; but it is more important to observe that the scheme does not appear to have any logical utility at all. How does it avail the logician, occupied with the concept as expressed in the general name which is the indispensable means of abstract consideration, to be told by what device of unconscious passage through the collective noun (which expresses a complex object of sense) the general name as instrument of abstract thought was originally forged? Collectives as such are to be considered by the logician only in order to be excluded. In Prof. Müller's suggested scheme of logical terms, and in all the controversial skirmishes through which he fights his way to it, there is no sign of his having ever fairly asked himself the question what the precise *philosophical* function of the logician is, or what bearing the history of the development of words, so far as it can be made out, could have upon it. To be sure, logicians in general, and Mill among them, have not been too careful to confine themselves only to such distinctions of terms, or pursue their distinctions only to such lengths, as concern their own business. They thus in many ways lie open to a criticism that could easily be made trenchant enough. But as for the emendations which Prof. Müller tries to make upon Mill in particular, it cannot be said that they are successfully or skilfully made. To prove this in detail, by comparison (as would be necessary) of statements of the two writers, is more than can be attempted at the end of this lengthy notice. It may suffice here to point to any two or three pages among the twenty or thirty from p. 444, in support of the charge against our author of a want of grasp in these matters of logical controversy. Or, to narrow the issue, let trial be made of his character for discernment—meaning, always, philosophical discernment—upon the three pages, 471-4, given to the topic of "Connotative and Denotative Terms".

THE ELEMENTS OF LAW NATURAL AND POLITIC;[1]

AND

BEHEMOTH OR THE LONG PARLIAMENT.[2]

THE service here rendered by a foreign scholar to the reputation of a great English thinker deserves warm acknowledgment. These carefully edited reprints of famous works, never before edited with any (or at least sufficient) care, would have seen the light four years ago (see *Mind*, ix. 618, xii. 481) if the publisher who originally undertook to bring them forth had not unaccountably left his engagement ever since then unfulfilled. The sheets that have lain all that time printed off are now at last made accessible to readers by the public spirit of Dr. Tönnies himself, who, rather than longer delay an act of justice to Hobbes, incurs the whole charge of issuing the two volumes. It cannot be improper to express the hope that students whether of English philosophy or of English literature will help him to bear the charge.

The first of the two volumes is philosophically the more important, though the other, with greater general interest, is not without philosophical significance also. Under the single title of *The Elements of Law Natural and Politic*, the two treatises so well known in separation as *Human Nature* and *De Corpore Politico* are now presented as interlocked parts of one continuous work. I have elsewhere, on more than one occasion, shown that the two little books, published separately in 1650 not from Hobbes's own hand (he being still in his Parisian exile, and at the time busily engaged on the completion of *Leviathan*, to appear in the following year), were written by the spring of 1640, some time before the Civil War, as one piece. It seems impossible now to determine exactly how far, if at all, Hobbes was concerned in the publication as it actually took place. Certain it is, from various MSS. of the original work still extant, that the little books as published neither were ever meant by Hobbes himself to be read apart, nor in point of fact represented in their separation the two parts into which, as suggested in the true title, the original work was from the first disposed; the first part as written covering, with *Human Nature* as published, no less than six chapters (set out as a first of two parts) of the published *De Corpore Politico*. The very valuable MS. copy at Hardwick Hall, containing with many scattered jottings the whole long dedication written in Hobbes's hand, first disclosed to me the unity of the work; but the fact, not before suspected, ought to have been discovered, without reference to MSS., by the indications of original unity left here and there in the dislocated constituents hitherto printed. Any way, the fact became evident, and its decisive import for a true understanding of the development of Hobbes's thought will, it is hoped, nevermore be overlooked by historians of philosophy. But now for the service which Dr. Tönnies, as no other, has seen to be wanting to the fair fame of the philosopher. Not only did he discover for himself, upon a number of MSS., the true relation of *Human Nature* and *De Corpore Politico* before this had been made known, but, resenting the manifest defects or errors of the published text, he determined to supply a correct one by collation (never before attempted) of all the accessible MSS. copies. These, of which there are as many as six (the large number being due to the fact that the work was freely circulated in MS. form from 1640), differ a good deal amongst themselves; the two of chief value having discrepant insertions or erasures in Hobbes's hand that show anxious and careful revision on his part. The problem was therefore, out of the varying MSS., to produce a text that should be not only free of misprints, but also as complete as possible. Since neither of the best MSS., to one or other of which the rest approximate, can be certainly taken as representing Hobbes's definite selection of phrase for the expression of his thought, it clearly was right to give, as Dr. Tönnies has given, the fullest possible text, with footnote indications of the changes which such a master of phrasing fell, at one time or other, upon making. But after all, in the case of a work which even in its hitherto unsatisfactory form has been regarded as a masterpiece of expression, the more important thing was to get rid, once and finally, of the blots disfiguring all the previous editions. This has now been done by Dr. Tönnies's collation of MSS., in the way that if most laborious is also most effective; and the fact that a much easier comparison of the various printed editions might equally have served to remove all the serious blots enhances rather than lessens the merit of his appeal straight to the original sources.

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[1] By Thomas Hobbes of Malmesbury. Edited with a Preface and Critical Notes by Ferdinand Tœnnies, Ph.D. To which are subjoined Selected Extracts from Unprinted MSS. of Thomas Hobbes. London: Simpkin, Marshall & Co., 1889. Pp. xvi., 226.

[2] By Thomas Hobbes of Malmesbury. Edited for the first time from the Original MS. by Ferdinand Tœnnies, Ph.D. London: Simpkin, Marshall & Co., 1889. Pp. xi., 204. (*Mind*, xiv. 429.)

One example (on which I have already touched elsewhere) from *Human Nature* will suffice to show what a work was left to be done for Hobbes by any conscientious editor. It should first be mentioned that nearly all the more important corrections made by Dr. Tönnies affect that part (more strictly, those chapters) of the *Elements* that first got into print as *Human Nature*: whatever the cause, it has fared better all along with the *De Corpore Politico*. Now, if Molesworth's edition, which was meant to become the standard one and which is practically the only edition accessible, is consulted at one of the most important points of Hobbes's psychological doctrine (*English Works*, iv. 68), this is what we read:—

> "*Voluntary* actions and omissions are such as have beginning in the *will*; all others are *involuntary*, or *mixed voluntary*; *involuntary* such as he doth by necessity of nature, as when he is pushed or falleth, and thereby doth good or hurt to another: *mixed*, such as participate of both; as when a man is carried to prison, going is voluntary, to the prison is involuntary: the example," &c.

Here "*mixed voluntary*" is nonsense, and has nothing afterwards corresponding to it, the subsequent explanation being of "*mixed*" only; also the words "such as he," &c., given in explanation of "*involuntary*," are unaccounted for, nobody having been mentioned before in the paragraph. Going back to the folio edition of 1750, which Molesworth had before him, and from which he probably printed, or rather (as Mrs. Grote's privately circulated recollections suggest) set his secretary to print, we get light on the second difficulty, the first lines of the paragraph thus running:—

> "Voluntary actions and omissions are such as have beginning in the *will;* all others are *involuntary* or *mixed voluntary*, such as a man doth upon appetite or fear; *involuntary*, such as he doth," &c.

The "he" is thus accounted for; but the monstrosity of "*mixed voluntary*" still remains, as it had figured also in the two directly prior editions of 1684 and 1651. This latter boldly gives itself out as, in comparison with the first edition of 1650, "augmented and much corrected by the author's own hand"; and here and there, no doubt, corrections are to be found, which may have been made by reference to some one of the MSS. copies which Hobbes had handled. That he was not himself, in any other way, responsible for the 1651 edition is, however, certain, since then for the first time the gross blunder of "*mixed voluntary*" appeared. Whatever the other shortcomings of the original edition of 1650, this particular passage had there been correctly given, by presence of an all-important colon between "*mixed*" and "*voluntary*,"—found again only in the small edition (of 250 copies) issued in 1812 by Philip Mallet, which, though it elsewhere goes wrong with the otherwise misleading edition of 1651, sets right this worst error of all. The example has thus far shown how, by comparison of editions if carried back to the first, or even (as it probably was with Mallet) by common-sense, the serious blots in *Human Nature* might have been removed without reference to MSS. at all. But, if now, by the side of Molesworth's peculiarly aggravated misrendering given above, the whole passage is read as Dr. Tönnies gives it (p. 62), it will be seen that his recourse to the original sources has resulted also in a positive gain:—

> "VOLUNTARY actions and omissions are such as have beginning in the will; all other are INVOLUNTARY or MIXED. Voluntary such as a man doth upon appetite or fear; involuntary such as he doth by necessity of nature, as when he is pushed, or falleth, and thereby doth good or hurt

to another; mixed, such as participate of both; as when a man is carried to prison [he is pulled on against his will, and yet goeth upright voluntarily, for fear of being trailed along the ground; insomuch that in going to prison], going is voluntary; to the prison, involuntary. The example," &c., as before.

The words, here for distinction put between brackets, are printed for the first time by Dr. Tönnies, and have undeniable force in pointing the illustration. Perhaps no other one passage could be cited where, within the same compass, there is so much at once added and corrected; but the example is none the less fairly representative of the improvements, negative or positive, made on every page of this new edition. If, with or without the chapters hitherto known as *De Corpore Politico*, the other chapters passing as *Human Nature* have taken rank as a philosophical classic, still more may that distinction be henceforth claimed for *The Elements of Law Natural and Politic*, now at last correctly and completely presented with all the traces of Hobbes's hand upon it.

As to the previously unprinted pieces here appended by Dr. Tönnies to the *Elements*, one of them at least, *A Short Tract on First Principles* (pp. 193-210), was well worth bringing out of its MS. obscurity, because of the curious stage it marks in Hobbes's passage, about 1630 (after he had learned some geometry), from the traditional scholasticism to the new mechanical philosophy of the century. The extracts given (pp. 211-26) from an unpublished *Tractatus Opticus* are of less account. If Dr. Tönnies is right, as he may be, in dating this treatise as far back as towards 1637, he can hardly have ground for saying that "it is evidently the first draft of what was intended as the second section of his system of philosophy, *viz.*, the *De Homine*". There is no reason to suppose that anything, optical or not, that we now read in the *De Homine* can have been drafted till a considerable time later. The point, however, is too unimportant, considering the relative unimportance of the *De Homine* altogether in Hobbes's system, to justify further remark upon it here.

The second reprint, *Behemoth*, can be welcomed in few words. Dr. Tönnies has found, in the library of St. John's

College, Oxford, what is evidently the original MS. of that racy production of Hobbes's old age. Composed towards 1668, and prevented from appearing by Charles II., to whom it was shown, it got surreptitiously into print from an imperfect MS. copy just before the philosopher's death in 1679; nor, though Hobbes's own publisher professed to give it from the original in 1682, can he have printed from anything but a less imperfect copy. The St. John's College MS., bearing corrections in the author's hand, has enabled Dr. Tönnies to fill in a large number of careless omissions of the copyists, and, further, some passages or phrases which, erased apparently from prudential motives, were not so obliterated that they could not in general be deciphered and restored. A dedication to Hobbes's friend at court, Lord Arlington, is, for the first time, made known; but, most important gain of all, we now learn the true title of the work with its special significance. Followed by the old sub-title, "The History of the Causes of the Civil Wars of England from 1640 to 1660," the name *Behemoth* seemed nothing more than a verbal fancy after the name *Leviathan*. It is now seen that, as this was taken from the Book of Job to pictorially mark "The Matter, Form and Power of a Commonwealth Ecclesiastical and Civil," so Hobbes went back to the same source for the name of the other monster to figure "The Long Parliament" that had reared itself for so many years against the lawful government of his country. Dr. Tönnies has found that, in a hitherto unpublished part of a letter to Aubrey, Hobbes spoke of the other as a "foolish title" when the unauthorised publication came upon him as a surprise in 1679.

PSYCHOLOGICAL AUTOMATISM.[1]

Closer examination confirms a first impression (*Mind*, No. 56, p. 598) of the special importance of this book. Among the recent productions of the younger French psychological school, it has features of its own that arrest attention. Nothing has of late been more remarkable than the great increase of psychological activity in France. With the *Revue Philosophique* there at hand, in monthly issue, to stimulate as well as welcome new investigation, a large number of more or less well-trained workers have thrown themselves upon particular problems of psychology, and have obtained results of no small interest and promise. While in other countries, where *positive* psychological inquiry is being pursued (as not yet in England) by an active professional class, the endeavour at present is rather to get more exact results upon the beaten lines of psychophysics, in France there has been a singular eagerness to break new ground for psychology on the field of abnormal mental experience—chiefly that state of hypnotic trance which lends itself so readily to the conditions of scientific experiment. In saying France, Belgium is not to be forgotten, with Prof. Delboeuf so much to the front; nor is it meant that in other countries (England this time not excepted) effective part has not been taken in hypnotic research. Still in France, as there, for whatever reason, hypnotic 'subjects' appear to abound in exceptional number and variety, so a larger body of trained and capable investigators has started up to turn the multitude of new, or at least newly ascertained, facts to psychological account. MM. Beaunis, Binet, Féré, Richet, are some of those that have of late been most active in the work of positive research as well as of interpretation; and now by his present volume, which sums up and brings to a head the independent investigation of some years past, Prof. Pierre Janet of Havre (not to be confounded with the well-known Prof. Paul Janet of Paris) takes rank among the foremost of those who are pressing on to issues of remarkable enough import.

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[1] *L'Automatisme Psychologique.* Essai de Psychologie expérimentale sur les Formes inférieures de l'Activité humaine. Par Pierre Janet, Ancien élève de l'Ecole normale supérieure, Professeur agrégé de Philosophie au Lycée du Havre, Docteur ès Lettres. Paris: F. Alcan, 1889. Pp. 496. (*Mind*, xv. 120.)

There is the more reason not to delay giving some account of the volume, as it happens that, in the present number (57) of *Mind*, M. Binet deals at first hand with the same question of double (or plural) consciousness upon which Prof. Janet's researches converge. The question, however, is one that otherwise might well have engaged attention earlier. Though first raised in its present form by Dr. Azam of Bordeaux in his report on the now famous case of Félida X. (see *Mind*, i. 414, 453), it has of late years forced itself also upon independent inquirers in this country. The lamented Edmund Gurney was led in the course of his hypnotic experiments (the more positive results of which were first recorded in *Mind*, see especially ix. 110, 477) to speculate, in *Proceedings of the Society for Psychical Research*, pt. xi., as to the bearing of his discovery of extremely involved alternations of conscious life on personal identity; and, again in the same *Proceedings*, Mr. F. W. H. Myers has obtained results from study of automatic writing that come still more directly into comparison with those of Prof. Janet and others in France. It was, any way, high time that psychologists of the older tradition should begin to reckon with the new class of facts. If the attempt is now made first with the work of a foreigner like Prof. Janet, this is because of its more systematic character. Strenuously as it has been conducted, the work of the English inquirers remains so far at a lower stage of psychological elaboration.

The title of Prof. Janet's book does not of itself lead us off familiar ground. Ever since it began to be at all understood how the nervous system was involved with mental action, it became a definite question whether bodily acts that seemed only less complex than those called voluntary had like these also a psychological character. Already in the middle of last century, Hartley quite accurately marked off 'automatic' from voluntary acts, and among the automatic distinguished between primary and secondary. Now, as secondary-automatic acts are such as begin by being voluntary for the individual, these obviously cannot be wholly divested of psychological character; yet, as automatic, they as obviously are related to those other (complex) activities which the individual never had to learn. There is no need, for the present purpose, to complicate the statement by referring to the change of border-line between the primary-automatic and the secondary-automatic introduced from the evolutionist point of view. However the line be drawn between them for the individual, or between the automatic and the voluntary, the question remains whether the automatic are to be held as related to the voluntary upon the physiological side only or also as phenomena of subjective import. It is a question that was rather hotly debated in this country some twenty years ago. On the one hand, the physiological relationship was by some brought so strongly into relief that it was argued as if physiology, which seemed to give a sufficient account of automatic action, could give the only scientific account of conscious action also; consciousness (when present) being represented as a mere accident or 'epiphenomenon,' interesting enough, no doubt, in a way, but without real significance. On the other hand, it was contended, with more or less consistency (or inconsistency), that, as consciousness could never rightly be so regarded, scientific analogy required that subjectivity in some form or degree should be predicated of all those 'automatic' physiological acts which stood obviously related to the more complex cerebral acts called (from the subjective point of view) voluntary or conscious. On both sides, though some reference was made to particular facts of experience, the discussion was essentially speculative, and in this respect did not differ much from the kind of general argument which, long earlier, Leibniz had urged in favour of a subconscious or unconscious mental life. Now it is here that Prof. Janet makes a distinct advance with his "psychological automatism". While ranging himself on the side of those who refuse to take consciousness as commensurate with mind, he arrives at the position by a line of strictly experimental inquiry.

The "automatism" with which he is able so definitely to experiment is, indeed, peculiar. It is not any action that is referable to lower centres in the nervous system (from the basal ganglia downwards), such as in earlier controversy has chiefly been considered. The motor response which Prof. Janet evokes in his 'subjects,' and which, in spite of their not being consciously aware of it while it proceeds—or, to speak more strictly (since he wavers in the use of the word "consciously"), in spite of their not remembering it after it is over—he yet claims as properly "psychological," is called forth by impressions that must be supposed to reach their appropriate 'centres' in the cerebral cortex. The automatism of the case lies, for him, in a dissociation from the general stream of conscious experience and activity that makes up the normal personality of the individual. Three abnormal conditions, related but different, are found in that class of hysterical patients to which (aided, in the happiest and most effective way, by two practising physicians, Drs. Gibert and Powilewicz) he has in the main confined his inquiry. The first is the *cataleptic*, the psychological significance of which lies in the extreme simplicity of the phenomena presented. In catalepsy (whether natural or induced), the 'subject,' otherwise unconscious, responds with specific movements to specific sensory impressions (or imposed emotional attitudes); thus manifesting, according to Prof. Janet, under strict experimental conditions, the true elementary mode of mental action, which Condillac vainly sought with his supposition of the marble statue endowed with first one and then another kind of passive sense-experience. The *hypnotic* state (proper) comes second, representing for Prof. Janet the next higher stage of mental complication; in which the motor response—so much more complex than in catalepsy that the 'subject' might appear quite normal to an outsider—depends no longer on mere sense-impressions, but on images involving (with or apart from direct sense-impressions) the whole mechanism of memory. And from this, as Prof. Janet contends, is further to be distinguished a third state, that may be called the *suggested*; in which, with no other modification of normal consciousness beyond a certain narrowing, the 'subject' is automatically determined to specific action by direct percept and most of all by the spoken word,—though here, as already in the hypnotic state, the act, as it grows more complex, is found less certainly to follow. Now a 'subject' may be wholly possessed for the time being with some one of these states, or, as Prof. Janet finds, the characteristics of one or other of them may appear concurrently with the normal consciousness of the individual (such as that may happen to be). Hence a division of his whole treatise under the two main heads of (1) "Total Automatism," (2) "Partial Automatism".

Chief psychological interest, at least as regards the question of plural consciousness, attaches to Prof. Janet's "Partial Automatism," but also in the first division of his work he brings into view many facts of striking significance, and discusses them with no ordinary insight. Of the truth of his initial position (supposing the facts to be all, as they seem to be, most carefully ascertained) there can be no question: it is in such isolated instances of movement following straight upon impression as catalepsy presents, and not in any bare sense-impression by itself, that we must look for the mental unit. What is practically the same truth had already, for a considerable time back, been accepted by psychologists, chiefly through demonstration, from the physiological point of view, that reflex action is the type of all nerve-process up to the highest; but, none the less, it is a very desirable and effective verification that is supplied by Prof. Janet's *psychological* study of cataleptic patients. Still more remarkable is his detailed treatment of Hypnotism. Chaps. ii., iii., on "Forgetting and Plurality of Successive Psychological Existences" (pp. 67-138), and on "Suggestion and Narrowing of the Field of Consciousness" (pp. 141-220), are a weighty contribution to the understanding of a subject which, if it has now fairly established its claim to the serious scientific regard withheld from it (through prejudice) at an earlier time, is, so far, anything but matter of scientific agreement. On the main questions now at issue among contending theorists, Prof. Janet has been led, by his own observations, to some rather decided conclusions. Without subscribing to the details of the Salpêtrière doctrine, he yet holds with this.

rather than with the opposite doctrine of the Nancy school and others (like Gurney and Prof. Delboeuf), on the point of the essentially abnormal, to the extent of morbid, character of the hypnotic state. He puts it, indeed, only in the form that there must be some "psychological disaggregation" before a person will pass naturally or can be thrown into the condition of hypnotism, but on the point itself his experience, so far as it has gone, leaves him pretty confident (p. 451). This, however, is one of his later conclusions, not brought into view while he is still at the stage of "Total Automatism". Here his main concern is to seize the truly distinctive feature of the hypnotic state, and this he finds to be a certain more or less complex modification of the function of memory. The hypnotic 'subject' (1) in reverting to the normal condition has no memory of what went on in trance, but (2) recovers such memory on going into the trance again. Exceptions to the universality of (1), as urged especially by Prof. Delboeuf (cp. *Mind*, xiv. 470), are rejected by Prof. Janet as apparent only. He has himself still another mark to add, though less constant, (3) that the 'subject' in trance remembers what has gone on in the normal state. The facts as to memory have been noted before, by no one, as he recognises, more impressively than by Gurney. What is peculiar to Prof. Janet is his insistence on them as constituting the whole specific difference of the state. Not that he would deny other modifications of the 'subject's' conscious life, especially when the state is profound; but, short of this, the break of memory on reversion to the normal state, with resumption of memory when the normal state is again in abeyance, is for him proof all-sufficient that the (normally) forgotten condition of conscious life was hypnotic proper. And, in so saying, it is not only the various physical signs relied upon by some that he rejects as indistinctive. He not less confidently waives aside the loss of independent volition, which is commonly taken as the characteristic and, in a practical point of view, critically important psychological note of hypnotic trance. For it is here that his other position is declared. There is a state in which 'subjects' are found to act (at least within limits) as if they had no will of their own; but, according to

Prof. Janet, it is not hypnotism. While hypnotics may be found unsuggestible, there are suggestibles who cannot be hypnotised. And if "suggestibility" thus fails as the test of hypnotism, it is a state that itself equally stands in need of explanation. Prof. Janet's account of it is that it is not found except where there is evidence of marked narrowing of the whole conscious field. This may result from "distraction" or what not—the limitation is for Prof. Janet the essential condition upon which the automatism of response, to verbal command or other imposed *percept*, depends. The state, in fact, as he urges, resembles the normal consciousness of children (or, as he might have added, the mental condition of lower animals), of which, with manifest limitation of general range, impulsive action is the most salient feature. It is only the matter of causation that Prof. Janet fails to prove in the case—that child or suggestible adult is irresistibly impelled to act *because* of the absence or reduced number of other conscious modifications at the time. At least, of people in general, it can hardly be said that their pliability from without is in proportion to their narrowness of mental view, when dogged persistence of aim is found so often to accompany this. (And, perhaps, the use of the word 'dogged' might suggest doubt as to the sufficiency of the explanation for the lower animals either.) Nevertheless, Prof. Janet's arguments are not to be lightly passed by; but all that he urges must be well considered for any satisfactory theory that may yet be devised to cover all the facts of hypnotism. For, if he does not rest content with the suggestion-theory that has so far gained the upper hand, he yet does not deny or ignore any of the psychological facts upon which it is based. Nor is it in any resort to a mystic supposition of physical influence—but, on the contrary, in a steadfast adherence to the ground of psychological experience—that he looks for a solution of the differences of view that as yet so sharply divide hypnotic inquirers.

The general outcome of the prior study of "Total Automatism" is that, while down to the lowest of the three states noted and discussed there is psychological (not mere physiological) process going forward, the result even in the highest of them stops short of the full and perfect work of conscious elaboration. Psychic activity, which at every grade takes the form of synthesis of experience, attains its highest development in a reference of the whole variety and mass of experiences to a unitary self or person. So far, then, as more or less independent strands of mental process are disclosed in the various kinds of automatism that alternate in hysterical 'subjects' with their common self-consciousness, not only is there the interest of studying the abnormal formations by themselves, but they may be máde to shed a new light upon the central problem of psychology. And still more, if evidence is next forthcoming that they can have an effective existence simultaneously with the subject's regular consciousness. The mustering of such evidence, with interpretation of it for the understanding both of what may be thus abnormal and of what is normal in mental life, is the task that Prof. Janet sets himself in his second and rather larger division of "Partial Automatism".

Readers must be sent to the book itself for the extraordinary story of different "psychological existences" which Prof. Janet has found to concur, as well as alternate, in this or that 'subject' of his. They come first distinctly into view in connexion with the treatment of hypnotism in pt. i., the peculiar phenomena of memory there disclosed giving the means of marking their distinctness. Léonie, for example, a demure peasant woman of middle age, suffering from hysterical anæsthesia of the left side in her common or now normal condition, becomes gay and saucy in a somnambulic state into which she is apt to pass or can easily be thrown, and can from this be thrown further (with intermediate stages of lethargy and catalepsy) into still another hypnotic state, in which there appears a greater fulness of conscious life,—at least in the way of memory. For, while Léonie 1 knows nothing of Léonie 2 or 3; and Léonie 2, cognisant of Léonie 1 as a humdrum *other* person, knows nothing of Léonie 3; this last adds to experience of her own a cognisance of all that has happened in the experience of Léonie 2 and Léonie 1, though taking them for different persons from herself and from each other. Other 'subjects,' Lucie and Rose, with different morbid history and symptoms, present equally, or still more, complex mental alternations, of like general character but varying in some particulars. Now, the abnormal states of these 'subjects,'—whether of the hypnotic type just mentioned, or of the simpler cataleptic type, or of the other distinguished as "suggested,"—being all marked by an activity that is more or less automatic, there is in this afforded a means of determining the effective presence of one or other of the states concurrently with the normal conscious life of the individual. The facts of such concurrence are given in a chapter on "Subconscious Acts" (p. 224-69). By easily-arranged experiments with his 'subjects' otherwise normally conscious, Prof. Janet gets well-pronounced partial catalepsies (of insensitive hand, arm, &c.); and, again, by mere "distraction" of the main conscious stream, obtains execution of more or less complex suggested acts. He thereupon studies at length the facts of "post-hypnotic suggestion," meaning acts which, suggested under hypnotism, are unerringly performed in the waking state or in reinstated trance. The different classes of fact join on to one another, and leave him at the end with the general conclusion, not only that there are real psychological processes going on outside the ken of the subject's regular personal consciousness, but that these may have a quasi-personal unity of their own.

So far, it is with this notion of independent synthesis accomplished to greater or less degree by the side of the main stream of consciousness that he advances beyond the traditional thesis of Unconscious (or Subconscious) Mind. He makes a further advance when he next goes on to seek for an interpretation of the plural experience which the different kinds of automatic activity—but chiefly the activity of hypnotism—give evidence of in the hysterical 'subjects' under investigation. The peculiar modifications of memory, before noted as sign of the hypnotic state, being now held to prove that the complex automatic acts abnormally executed imply the presence of other "psychological existences" besides the normal one, the question is, what explanation can be given of the interwoven breaks and resumptions of memory? Here the anæsthesias of Prof. Janet's 'subjects' assume a critical importance. It is to be borne in mind that the normal consciousness of those 'subjects,' though rounded off into the usual personal form, is maimed and imperfect to the extent of their want of sensibility; the anæsthesia affecting not only the skin (part or whole) but also, it may be, other organs of special sense, including that one of highest objective efficacy, the eye. Now, first, it may turn out with 'subjects' of this class that, on passing or being thrown into the abnormal hypnotic state, they acquire a fuller consciousness, by ceasing to manifest the anæsthesia of the normal (hysterical) state; and if, as in the case of Léonie, &c., they are susceptible of different degrees of hypnotic affection, it may be in the most advanced and rarest of these (for them) abnormal states that they most nearly approach to the normal condition of healthy people. Certain it is, according to Prof. Janet's experience, that only when, after being in any particular state of whatever degree, they again pass or are thrown into a state of the same kind or degree, do they have memory of what went on in its previous occurrence. This assertion holds without qualification (as one may say) *downwards: i.e.*, in any state, including the 'subject's' normal one of lower sense-potency, there will be no memory of what went on in the hypnotic state of higher sense-potency. Only in some still higher one, like that of Léonie 3 or Rose 4, may there be, along with exclusive memory of its own, memory also of all that has gone on in any lower state down to the so-called normal (Léonie 1, Rose 1). The memory, in fact, seems to be a function (as mathematicians would say) of the amount and kind of effective sense present in any of the states. And this conclusion can further be supported by more specially arranged experiments. Prof. Janet's 'subjects' being open to suggestions in their common and also in their hypnotic states, he can produce in them "systematised anæsthesias," meaning suggested loss of sensibility within strictly defined areas, especially of skin or eye. The phenomenon was well known to the older mesmerists; a reference to whom at all points is, by the way, one of the most interesting features of Prof. Janet's exposition. His own merit is in employing it as test for his view of memory as giving, by presence or absence, the one means of distinguishing between different "psychological existences". So far as can be judged from the record of his experiments, these seem to have been conducted with all due care, and they may be taken to warrant his conclusion as to the relation between memory and (effective) sense in his 'subjects'. It may be the more readily accepted because, after all, it only bears out the current psychological doctrine that the representative image, as it directly revives the sense-percept for consciousness, involves excitation of the same cerebral parts. Since there can be no doubt that the anæsthesia of hysterical 'subjects' depends upon central rather than peripheral disturbance of the nerve-system, what hypnotism may be supposed to do for them is to restore the working of parts of the cerebral mechanism that have got out of gear, and thus promote mental efficiency for the time being. So far, on the other hand, as quite healthy persons may be hypnotisable at all, the effect in their case might rather be to throw the cerebral mechanism out of gear, with general loss of mental power, though with the possibility of abnormal heightening of particular functions set free for the time from regularly balanced control. However this may be, the relation that seems to be established, by experiment with those hysterical 'subjects,' between memory and perception, or (as it may be put more generally) between representative and presentative experience, has, over and above the light it throws on the varying complications and disintegrations of their mental life, an undeniable importance for psychology in general.

But the question still remains, how the plurality of "psychological existence" is to be reconciled with personal unity. Not to leave untouched what Prof. Janet has further to say on this main point, many other interesting observations on the behaviour of his 'subjects,' all discussed with much psychological acuteness, must be passed over. His whole next chapter (pp. 367-433), on "Various Forms of Psychological Disaggregation," can also be little more than mentioned. Here he reviews the different phenomena that in all ages have suggested the notion that certain forms of human action reveal the agency of external spirits, demons or what not, working through the human medium. That all of them—from the wonders of the divining rod, &c.,

through present-day spiritism, to the facts of impulsive madness, fixed idea, hallucination and possession—are (dupery apart) explicable from resolution of normal conscious life, in the 'subjects' of them, into separate strands of experience (passive and active) that run on together without mutual cognisance, is shown by Prof. Janet at length with excellent effect. For him they are but cases, more or less pronounced, of what he then goes on, in a final chapter (pp. 444-78) of pt. ii., to describe as "Moral Weakness" in opposition to "Moral Force". "Moral weakness," or "psychological misery," is that state of general disorganisation in which the mental life splits up into a number of groups of "sensations and images" working themselves out with an automatic regularity and relative independence. The antithesis is that "moral force" of the healthy individual, in whom, though automatism is also there (as seen in the phenomena of distraction, instinct, habit, passion), there is one supreme controlling activity whereby the whole mental economy is held together. What, then, is the nature of this highest activity, in the abeyance of which it is that the elements of normal personality are so prone to fall asunder? Prof. Janet, for his part, can find it only in a volition that has no direct relation to such ideas (*viz.*, percepts and images) as are always in themselves automatically motor, but on the contrary depends upon a perfectly disparate class of "ideas of relations" or "judgments," not by themselves motor. He takes up, in fact, a position analogous, as he says, to the apperception-theory of Prof. Wundt or to the *réflexion* of Maine de Biran (who, it is evident throughout, has had a special influence on his whole manner of psychologising). Some slight indication is then offered (p. 474) as to how the volition thus determined by pure intellect may get into working relation with the images and percepts that have motor efficiency. It is, however, all too vague to afford a basis of useful discussion. And as something more may soon be said in these pages on the general question of will and automatism, anent Dr. H. Münsterberg's notable researches (cp. *Mind*, No. 56, p. 607),[1] there is the more excuse for abstaining from discussion at the end of a notice which, though not short, has been rendered by circumstances much more perfunctory than was intended. Its main purpose, however, will after all have been attained if the reader is not left in doubt that some of the deepest questions of psychology, and of philosophy too (in which connexion a short general "Conclusion," pp. 479-88, is not to be overlooked), have been placed in a new light by the labours of Prof. Pierre Janet.

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[1] See above, "Dr. H. Münsterberg on Apperception".

THE PSYCHOLOGY OF THE BELIEF IN OBJECTIVE EXISTENCE.[1]

DR. PIKLER'S essay, mentioned in *Mind*, No. 60, p. 571, is a still more carefully reasoned piece of work than it seemed at first sight. Taken along with Mr. Stout's earlier-published but later-written article on "The Genesis of the Cognition of Physical Reality" in No. 57, it prompts to return upon a subject that had previous discussion here under title of "The Psychological Theory of Extension" (Nos. 51-3), but which at starting (No. 51, p. 418)[2] might have been as well designated "The Psychological Theory of Sensible Object". This, at all events, is the topic which I hope, before long, to take up again in *Mind* and to treat more adequately than in the two or three pages of general indication offered before. Dr. Pikler gives special occasion for such return, because nobody is so express and decided as he in maintaining a position which, so far as I can still see, is in the scientific point of view seriously mistaken. Thus, at p. 38, he declares that "our belief in the objective existence of matter or things arises only in consequence of our belief in the objective existence of space," which he makes the subject of prior psychological explanation. Apparently he attaches no importance, if he gave any attention, to the particular line of argument here advanced in a sense precisely opposite. That is a reason, added to one's failure to make serious impression upon the others (Mr. Ward and Prof. James), against whom at the time the argument was more especially pointed, for trying to restate it in more effective form. But, since the question is to be limited to Sensible Object (though that may turn out to involve a good deal more), it will simplify matters as regards Dr. Pikler, who must henceforth be considered among the foremost authorities on the whole subject, to give beforehand some account of the more general scope of his essay. Open, as I think, to exception both in principle and result, it is yet in more ways than one a very remarkable production.

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[1] Part I. "*Objectiva* Capable of Presentation." By JULIUS PIKLER, Doctor of Political Science, Lecturer on Philosophy of Law in the Royal University of Budapest, &c. London: Williams & Norgate, 1890. Pp. 118. (*Mind*. xvi. 100.)

[2] See above, p. 279.

It is, first of all, remarkable as written in English by a Hungarian hand. Whether his choice of language has been made from an opinion of the superior pliability of English to psychological uses or because the problem of the essay has so largely occupied the attention of English thinkers, Dr. Pikler's readers may thank him for it; nor does he suffer by the choice. Though his sentences are at times rather laboured or even awkward, they do not fail at other times to be singularly pointed and effective; and, marked as his thought not seldom is by almost an excess of subtlety, it is really interesting to note how he always manages to make plain his meaning even to its finest shades. But, however it be with his means of expression, there is no question of Dr. Pikler's special indebtedness to the psychological work of the English school. This is manifest throughout from the very freedom with which he criticises its chief representatives. To J. S. Mill in particular, despite all difference, he stands in such close relation that his whole theory, so far as yet expounded, may be described as an effort to give full and satisfactory development to Mill's well-known doctrine in the *Examination of Hamilton*. And it is an effort that may be welcomed, as well as judged on the whole successful, even by those to whom the right solution of the object-problem does not seem attainable on Mill's lines.

What most distinguishes Dr. Pikler from Mill and the other English psychologists is the generality with which he conceives the problem. More careful than they to mark it off from the question of perception (to distinguish, *e.g.*, between the mere perceiving of space and the belief in its objectivity), he is still more decided on the point that the problem is not exhausted with an opposition of matter and mind. His own fundamental division of *objectiva* is into the two classes of—(1) capable, (2) incapable, of presentation; and each includes for him a large variety of particular cases.

In the present volume, only the first class of objectives is covered; the question of belief in the existence of minds and other unpresentables being left over for future handling. He maintains that the psychological problem of material object can be completely solved without reference of any kind to other consciousness than that of the individual subject. But, whereas Mill, with whom he shares that opinion, took up, at the prior stage, only the question of the external world, Dr. Pikler finds this to be but one of a number of equally presentable objectives, and by no means the first of them to call for scientific regard. Not only, as already mentioned, does he put the question of space (and time) before matter, but, prior to time and space as objects, he holds that we may become conscious of objective attributes pertaining to our bare (subjective) presentations; and he charges it against all previous psychologists that they have overlooked this true beginning of a science of object. It is not surprising, then, that, working up from such a depth, he should not stop short with the material things of sense, but should bring within his theory of presentable object the "existence of cognitions (beliefs, memories, ideas)," and also such facts as that we can ascribe an "objective intensity" to presentations other than what we may be (subjectively) experiencing, or, again, that we may speak of mental states as actually or objectively present though "unconscious".

Nothing but praise is due for the care with which it is thus sought to muster together all the different classes of objectives agreeing in presentability. And, if the enumeration, as a whole, stands good, whether in Dr. Pikler's or in any other order, he must be allowed to have made a sensible advance in treatment of the object-problem with his fundamental distinction of presentables and unpresentables. It is less clear that he is right in thinking that this or that particular class of presentable objectives has been overlooked altogether by his predecessors. He asserts this especially of his first class—what he calls "attribute-presentations" or "objective attributes of our presentations". There are, in his view, eight of these altogether, as he thinks well—though his immediate task does not require it of him—to mention (p. 19): resemblance or difference, time-relation, local (space-) relation, duration, intensity, extension (*sic*), position, number. It cannot very seriously be maintained that these (or at least some of them) have not been recognised by psychologists as having a certain objective character abstracted from the (subjective) presentations to which they can be attributed. But it is of more interest to ask whether such objective character is so well and clearly marked as to be made, with Dr. Pikler, the prerogative instance of objective experience.

Dr. Pikler's reason for putting first this class of objectives is not expressly stated, but may be guessed with sufficient probability. The psychological problem of objectivity is, in spite of some rather ambiguous language at starting, rightly conceived by him as a question of how presentations, which are essentially facts of subjective experience, come to appear as having an existence (or subsistence) apart from the mind's perceiving. Now if (subjective) presentations, without ceasing to appear to be such, can be shown to have certain fixed attributes, whether intrinsically or in their relation to one another, that are not in the same way subjective as the presentations themselves, this fact would seem to be objectivity at the first remove, and to require, as well as admit of, explanation before any other part of the whole problem. But, should this be allowed, and the question as to space and body be then made to follow, one does not very well see why Dr. Pikler's later classes of objectives, which all have reference to phases of subjective consciousness, should not also be explained before the interpolated cases of "time and space" and "the external world". Can it however be allowed that the treatment of the whole problem should be so begun? Surely not. Be it as it may between space and body (of which more anon), it is not to be doubted that only after we have apprehension, somehow, of an external world is there any express consciousness of presentations or representations as facts of subjective experience in which may then be remarked attributes or phases with a character of relative independence and fixity. The attempt, in short, by Dr. Pikler to work out a complete scheme of presentable objectives, whatever its general merit, results in an ordering that can hardly be called other than highly artificial. It neither corresponds with the (historical) order of actual development in any consciousness; nor, by placing some of its later terms so far apart from the first, does it satisfy the requirements of an order of logical development. The two points of view—logical and historical—are, in fact, confused in Dr. Pikler's scheme. I take leave to say this, in spite of his careful distinction, at starting, between the *meaning* and the *genesis* of belief in objective existence. His treatment of "the genetic question" in one chapter at the end of the present essay understands this in a far too limited sense and is besides of a rather perfunctory character; while his remark quoted above from p. 38 shows him, in practice, not by any means careful enough to keep out an admixture of genetic considerations at the analytic stage.

A word now on Dr. Pikler's principle of explanation for all cases alike of presentable objective. Belief in such objective existence is, he holds, belief in one's ability to obtain this or that kind of presentation at will. Here may first be acknowledged, over again, the seriousness with which he conceives his psychological task. The essential meaning of objective—however afterwards aggrandised, in some cases, by reference to a common consciousness of different minds—may and should, he thinks, admit of being accounted for in terms of individual consciousness. Nor, in limiting his means of explanation to psychical fact or process of the most immediately personal kind, does Dr. Pikler at all minimise the problem. It is a true objective, independent of the individual's consciousness, which he is concerned to evolve from the consciousness of the individual. This is to take the psychological question seriously. And it need not be denied that a consistent meaning for presentable object may be found in Dr. Pikler's terms. Indeed, as he puts it, the assertion is little, if at all, more than an identical proposition. Whatever is by me *presentable* object in the world without, or whatever in the world within I may be ready to call *objective* because of its determinate possibility—*sc.* practicability—of presentation, is, in so many words, something that I can through act of will come to have a presentative experience of. If, on the other hand, the assertion be understood to have real import, it has hardly waited for Dr. Pikler to be made. Prof. Bain, for example, has told us (*Mental and Moral Science*, p. 199), as regards the external world, that "our object-experience consists of the uniform connexion of definite feelings with definite energies," and, in the wider reference to object in general, has given his well-known analysis of Belief under the head of Will. Obversely; it is cleverly urged by Dr. Pikler that the most distinctively 'subjective' of all experiences—our state of good or bad humour—is just that over which we have least voluntary control. It may be allowed, then, that there is no difficulty in putting such an interpretation upon 'presentable object' as Dr. Pikler seeks to carry through. But the question remains whether this is the primary and most natural interpretation—whether the notion of a 'possibility' of experience through will of mine is not secondary to the notion of a 'necessity' of experience which, in given circumstances, no will of mine can overcome. What says Dr. Pikler himself, at p. 71, when arguing that a man's "own world of memories and beliefs" is as truly objective for him as that external world which is common to him with others? "The particular parts of it are just as well defined, and exist *objectively as independently of our will*, as the particular things of the external world." The words I here italicise, falling so naturally from Dr. Pikler's pen, are in curious conflict with the theory he works out in the essay. And note, too, the bearing of the last clause of the sentence. "The particular things of the external world" are, for Dr. Pikler also, so much the type of what is truly objective that it lies to hand to remark that, by his own allowance here, the solution of the psychological problem of object should start therefrom. But, however much one may be concerned, on another occasion, to urge this point, it would be wrong to part from Dr. Pikler now and not repeat with emphasis that his treatise, as a whole, must henceforth be very carefully reckoned with by anybody who would essay the crowning question of psychology.

THE IDEOLOGISTS.[1]

THE author of this important volume essays a task of no common magnitude. Rarely has there been a greater, or at least a more varied, intellectual outburst than marked the revolutionary era of French history. M. Picavet traces its origin, follows it along the multifarious lines that it took, and seeks to appreciate the abiding value of its results. The industry he displays is immense, and hardly less remarkable the historical and critical insight. Writing also clearly and with force, there is not an aspect of the movement that he does not effectively portray, not one of its hundred figures, small or great, that he does not manage to invest with interest. But it must be added that the very thoroughness of his work over so wide a field has at times a somewhat overpowering effect. And when it comes to looking back upon the whole moving scene, one sighs for index as a means of keeping hold of it all. Why, with all its fine gift of exposition, is the French mind hardly more careful than the German to employ that simple help for making its labours of ready service to the busy student?

The revolutionary movement of thought in France, called Ideological by Destutt de Tracy, one of its chief leaders, has a special interest for us in this country, as M. Picavet is forward to point out. If English thinking has in this generation recovered in France something of the same kind of authority that was yielded before the middle of last century to the thought of Locke, it has done so in forms that were moulded not least by influences received from France itself. In fact, during the modern period an alternate process of give-and-take between the two countries has always been going on. Locke, who seemed to overcome Descartes in France, had owed more to Descartes than to any other of his predecessors. So the later English psychology, which has supplied so manifest a stimulus to the French activity of mental research at the present day, had its own line of progress, at an earlier time, very markedly affected by the Ideologists. Hamilton was quite right when he signalised the origin, in D. de Tracy, of Thomas Brown's theory of external object, taken up afterwards and developed by J. S. Mill, Prof. Bain and others. The discovery does not seem to have been made by Hamilton till his later days (*Reid*, Note D, p. 868 n.), but already in his early onslaught upon Brown (Art. "Philosophy of Perception," 1830) there is some general reference to the school which he gives Cousin, after Royer-Collard, the credit of overcoming. Such overthrow, in as far as it took place, is but another effect of the interchange of thought between the two countries, since Royer-Collard (from 1811) was stirred to his revolt against the Sensationalist tradition in France by no other than the influence of Thomas Reid. As for the Hamilton of 1830, it is not out of place to add that one cannot easily now read without smiling the tones of portentous solemnity in which he speaks of those high interests of morality and religion which, under Locke's influence, had been wrecked for nearly a century in France, till the great Cousin at last stood forth to stay and save. It is not creditable to Hamilton's discernment that he should at any time have let himself be imposed upon by that flighty rhetorician. Had he known, too, a little more intimately the work of those, whether called Sensationalists or Ideologists, whom at that time, apparently, he was content to take at the estimate of their foes, he might have recognised that in Degérando and Laromiguière, then still active, there was as much concern for religion (not to say morality) as the belauded Cousin ever showed; that Cabanis himself, more than twenty years before, had supplemented his scientific inquiries into the relations of mind and body by a grave philosophical argument (*Lettre sur les Causes premières*) for religious interpretation of the universe; and that in the earlier generation Condillac, for all his psychological insistence upon sense, was a most ardent spiritualist and theist.

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[1] *Les Idéologues.* Essai sur l'Histoire des Idées et des Théories scientifiques, philosophiques, religieuses, &c., en France depuis 1789. Par F. PICAVET, Docteur ès lettres, Agrégé de philosophie, Maître de conférences à l'Ecole des hautes études, Lauréat de l'Institut. Paris : F. Alcan, 1891. Pp. xii., 628. (*Mind*, N.S., i. 118.)

But wherein lies the distinctive character of the Ideological movement, as we may now understand it with the help of M. Picavet's practically exhaustive research? Less in its method, which had been applied by others before to the investigation of mind, than in its aims begotten of a time of high humanitarian enthusiasm. It was essentially a revolutionary movement. Education, government, the whole frame of society were to be recast; the renovation being based upon a scientific analysis of "ideas," or developed human experience, driven, with that all-inclusive practical purpose, deeper than ever before. The enterprise indeed, even in its practical bearings, was not novel. Locke's "way of ideas," which remained the whole method of the French revolutionary thinkers, had for him also a practical, quite as much as a theoretical, significance. And one object, uniting considerations of both theory and practice, namely, the direction and furtherance of the work of special science, had been as present to the mind of Hume as of Locke in their new analytic treatment of human "understanding". But the progress of the positive sciences had come, by the end of the eighteenth century, to exert an ever-deepening influence upon philosophic minds. The French thinkers who, after Condillac, continued to draw their main inspiration from Locke had it forced upon them to make mental inquiry more and more expressly scientific in form, on the model of the other sciences; while yet contending that these others could be systematised and co-ordinated only from the point of view of the mental inquirer. Getting then, after the revolutionary Terror, the opportunity of building upon a ground that had been swept bare, they made it their first practical concern to refound the whole higher instruction of France, and to organise, in the Institute, the means of universal scientific advance. In both departments—of research as of instruction —"Analysis of Sensations and Ideas" (or other equivalent designation) was put forward to mark the particular line of scientific inquiry and consideration that should henceforth take the place of an arbitrary "Metaphysic" in relation to all other actual or possible varieties of human knowledge and endeavour. So may we represent to ourselves, in general, the nature and scope of the movement.

Leaving aside for the moment M. Picavet's introductory question of the "Origins," we may first note the chapter (pp. 20-100) in which he gives account of the Ideologists' "Relations, political and private, academic, scientific, and literary". It is truly a marvel of painstaking research. The work remained for M. Picavet to do, and he has done it once and for all. Nothing that one can desire to know of the new institutions, educational and other, set on foot from 1796, or of the men, obscure as well as prominent, who helped in their founding and working, is here left unelucidated. The class of Moral and Political Sciences, second of three composing the Institute, had but seven years of life before Napoleon, who as General Bonaparte could speak about "ideas" with the foremost (p. 80), abolished it in his pique at being unable to retain the good opinion and support of the philosophical leaders who, in their desire for a more settled political order, had helped him to his supremacy in the State. From that time it was that "Ideologist" became his favourite term of contempt for all those whose serious scientific and social purpose would not bend itself to the service of his personal ambition, and in a depreciatory sense passed readily enough into currency with many who had been proud to bear the name. But Napoleon's impatience of mental independence did not deprive the school of its means of official utterance before its work had been in effect done. And it needs but an unbiassed study of its chief productions to see that at least the leading spirits, Cabanis and De Tracy, if over-sanguine in their enthusiasms, had no such deficiency of practical sense as the title of their choice was made to imply against them.

The work of the Ideologists is, in effect, summed up in the writings of the two men, Cabanis and De Tracy, and all the more because of their complementary relation to one another; De Tracy confining himself, for the most part, to properly subjective consideration, while Cabanis made it his business to discover the physiological conditions of mental process. But with M. Picavet the work of the two (done within some ten years from 1796) and of those whom they more especially influenced constitutes but one of three stages that may be distinguished within the whole movement. To a later "generation" are referred, with others of less note, Degérando (1772-1842) and Laromiguière (1757-1836), who, though already active by the side of De Tracy and Cabanis in the revolutionary years, did not attain their prominence till a later time, when it was left to them to continue the Ideological tradition in face of the strong reaction that had set in against it, but to continue it in a modified form, at once "spiritualist and Christian". And a "first generation" is made of writers, like Condorcet and Volney, whose work, in conception if not also in execution, reaches back to the pre-revolutionary period and is to be ranked with that of the Ideologists proper because of a general similarity in method and aim.

M. Picavet gives a very interesting chapter (pp. 101-75) to these immediate forerunners, who were all in more or less close relations with Cabanis and De Tracy; but, for the right understanding of the central pair, it is of greater moment to note what he otherwise seeks to establish concerning the origin of their thought. The most obvious question is of their relation to Condillac, the dominant French thinker of the eighteenth century, and this is a question which M. Picavet keeps in view all through his exposition and would very decidedly answer. He speaks with an exceptional knowledge of Condillac, having some years ago edited with characteristic care a part of the *Traité des Sensations*. He has, moreover, for the present inquiry, made an elaborate survey of all prior influences, French or other, that can have affected the Ideologists; though in his book, as printed, some two hundred pages which he had written on this topic have had to be condensed into an introduction of less than twenty. In the result, according to him, it is a grave historical mistake to subordinate the Ideologists to Condillac as master. Though agreeing with Condillac in the general psychological method he had taken from Locke, they criticised him with the utmost freedom and made claim to have advanced indefinitely beyond his positions. Neither was Condillac himself, from the middle of the century till his death in 1780, by any means the solitary thinker of mark and power in France that he is commonly represented. And when we go back beyond Locke, to whom the allegiance of the Ideologists is undoubted, it is to Hobbes and Bacon, outside of France, that they are seen to stand most near; while, in France, it was at least as much from Descartes as from Gassendi or from the line of sceptics reaching back through Bayle and others to Charron and Montaigne that they drew. In all this contention by M. Picavet there is much freshness of historical insight, and especially noteworthy is the evidence he adduces that never in the eighteenth century did Descartes cease to be an active philosophical force among his countrymen. With the Ideologists, at any rate, he stood in high credit—in higher credit (it is interesting to note) than with Royer-Collard, the initiator in the second decade of the nineteenth century of that spiritualist reaction which later on was fain to connect itself with his celebrated name. As to the Ideologists' independence of Condillac, however, M. Picavet's proof is not very decisive. It is just as easy to find in the pages of De Tracy and Cabanis professions of discipleship as reclamations against this or that shortcoming of their psychological predecessor. They were in truth very specially beholden to him; but, over and above their novel breadth of practical aim, they had the characteristic—in a remarkable degree for their time—of seeking to connect their thought with the best (as they conceived it) of method or principle that they could find among all the streams of modern inquiry. They looked upon themselves as the crest of the whole advancing modern wave. This confidence is curiously manifested in a criticism on Kant which De Tracy read to the Institute in 1802. Some of it (as given by M. Picavet, pp. 347 ff.) is not at all ill-pointed as special criticism, but more significant is the general judgment passed, as from a higher level, on "les philosophes allemands"—who retain the prejudices of the old school-doctrine, do not know of the observations that have been made in France, take no account of origins, language, method of calculus, but regard the human mind as an abstract thing, &c., &c.

Cabanis and De Tracy occupy between them more than a third of M. Picavet's book (pp. 176-398). His plan is to interweave with accounts of their lives abstracts, more or less critical, of their writings, in order (as far as possible) of composition. The work is done with so much intelligence and sympathetic care that for most readers the abstracts may well supersede the originals, though some can hardly fail to be led on by them to a direct contact with the writers. Cabanis (1757-1808), the slightly younger man, was, as long as he lived, perhaps the more prominent or representative figure of the two, and he lived long enough to cover not only the period of his yoke-fellow's effective authorship but also the whole time of their school's undisputed influence. He had all the warmth of nature and easy flow of utterance helpful in the impressing and attaching of other men. Though philosophic purpose was never absent, literary production took with him a somewhat wide and varied range. Of scholarly habit from youth, before taking up the medical profession, he wrote early and late both as scholar and as physician; and in his master-work, the *Rapports du physique et du moral de l'homme*, which embodies much of his own medical experience, the literary touch is present in a high degree. It brought together a series of memoirs read to the Institute from 1796, some others being added when the book was made up in 1802. By that time Cabanis, who had been very active in support of Bonaparte's *coup d'état* in 1799, had his disillusions; and, suffering always from most uncertain health, he appears to have been anxious not to delay bringing out the results of his protracted inquiry and reflexion on the mental relations of mind and body. The book, as it appeared, has much less of system and orderliness than Cabanis would claim for it; but it is more easy to understand the enthusiastic interest with which it was received at the time than the comparative neglect into which it has later fallen. With an expert's knowledge of all that had been discovered or surmised from Hippocrates downwards as to the human bodily constitution, Cabanis set himself to bring it into definite relation with the results of mental introspection pursued in the scientific spirit of Locke and Condillac. By analysis of his own, he was able to bring into view, with more clearness and precision than anybody before him, the whole range of organic sensibility underlying the external senses. Completely overlooked by Condillac, these "internal impressions," the simplest and most truly primordial of all human experiences, reaching back as they must do to the period of fœtal life, were first understood by Cabanis in their peculiar psychological significance, more especially in relation to the earliest (apparently) automatic activities. But his merit lies less in a special discovery like this, important as it is, than in his grasp of the general position that, in their relation to bodily conditions and processes, the facts of mental experience are to be taken directly as such, apart from metaphysical construction. The "relations" to be established are purely phenomenal. His clear perception of this fundamental condition of scientific treatment lends a value to his results which is hardly lessened by the imperfect knowledge of the nervous system which belonged to his time. He distinctly anticipated the position at which all psychophysical inquirers now place themselves; and, though in particular unguarded expressions, like that when he speaks of the brain as "*en quelque sorte* digesting impressions" and as "performing organically the secretion of thought," he lets himself be overborne for the moment by the obviousness of the physical, yet even in the *Rapports*, still more in the later *Causes premières*, he shows himself well aware of the unique import of conscious sensibility. The "relations" established are, indeed, for the most part of a very general kind; but this was inevitable at starting. As a general basis for the most developed doctrine of physiological psychology thus far attained, his exposition may still effectively serve. Certainly, nothing in its way so striking has yet been produced by other hand. Nor, for all the undeserved neglect with which he has been treated by later inquirers, has even this been unrelieved. An edition of the *Rapports* (and *Causes premières*), issued in 1844 by L. Peisse, is a model of careful and judicious commenting, all the more valuable because of the perfect freedom of animadversion which the editor feels bound to allow himself. This is the edition to be recommended to the student who wants to go beyond M. Picavet's admirable analysis.

Count Destutt de Tracy (1754-1836) has had still less justice than Cabanis from historians of philosophy. Lewes is almost alone in giving prominence to either, but, while he seizes fairly enough the importance of Cabanis, says nothing to the purpose in his two pages on De Tracy. Yet De Tracy was a very remarkable man, and a thinker whose performance is only less remarkable than his ambition. He now stands very well revealed in the biographical facts and characteristics recorded of him by M. Picavet, to which there is only wanting some more definiteness of detail towards the end. A self-contained man, of high and strenuous purpose, he had already been given to scientific study while playing the gay soldier at court. When the revolution burst, he was forward to resign all aristocratic privilege and range himself with the popular party, though never exaggerating the social and political evils that had to be redressed. Not all his patriotic ardour and self-sacrifice availed to save him from incarceration and imminent peril of death at the height of the Terror. When he escaped condemnation by the fall of Robespierre and was set free again, the studies which he had calmly pursued in prison had brought him so far as to see, by help of Condillac and Locke, that a "Science of ideas" was the thing above all needful for the advancement of knowledge generally and for the conduct of life. This accordingly he proceeded to develop, with gradually widening view, in a series of Institute-memoirs from 1796, revised and recast for publication in 1798. He had then hold of his main conceptions, but their practical applications, educational and other, did not become clear to him till he was called to act (1799-1800) on the Council of Public Instruction; and it was with an educational purpose that he then gave to his philosophical views their systematic form in three parts (Ideology proper, Grammar, Logic) of *Éléments d'Idéologie*, 1801-5. Later on he added a fourth part, of Economics, and the beginning of a fifth part, of Morals, towards a treatise of "Will and its Effects," as his first three parts had together made up a treatise of "Understanding"; but, though he had still, in 1817, some twenty years of life before him, his powers were then confessedly spent, and indeed it is hardly beyond 1805 that his philosophical impulse is to be reckoned. Up to that time it worked with freedom and efficiency. Two features of his thought are specially to be noted. (1) It is undoubtedly from him that the import of conscious muscular activity for the psychological problem of object first got distinct recognition. Condillac in France, Hume and Berkeley in England, had (after Locke) each more or less clearly faced the problem; Rousseau, whose psychological tact (in *Émile*) deserves more acknowledgment than it has got, had descried the perceptual value of the motor factor. But it was De Tracy that first put all together and, though not without some wavering, laid the foundations of a scientific theory which many hands have since helped to rear. To the conception of object as primarily *obstacle*, one finds, on reading, that he had already given the most definite expression; and there are other points of moment in the theory, as the prior objective character of the subject's own body in relation to all others, which he anticipated with equal clearness. (2) Before Comte, and in a profounder way than Comte, he conceived of human knowledge as an inter-related system of positive sciences. The very designation "positive," which has made its fortune in the present century, is in use with De Tracy and others of the school. Comte, there can be no doubt, took it from that source, and if he had learned also the need of starting with what De Tracy liked to call the "History of our Means of Knowing," his work of scientific ordering might better have claimed its assumed title of Philosophy. Particular ideas, too, commonly regarded as most characteristic of Comte, are plainly foreshadowed in De Tracy or Cabanis. These M. Picavet does not overlook; and, altogether, he is well justified in placing the great Positivist among the "Auxiliaries, Disciples and Continuers" of the two Ideological leaders.

The hundred pages under this title (399-497), in which he proceeds to muster these, with excellent effect, from all departments of science and literature, can here only be mentioned; nor can more be done for his final chapter (pp. 498-570) on the "Third Generation," in which are grouped round Degérando (Dugald Stewart's friend) and Laromiguière a number of minor figures, spanning the whole time till with MM. Taine, Ribot and others the movement of scientific psychology in France was started afresh under foreign stimulus. Among the direct adherents of Cabanis and De Tracy the man of greatest mark is Maine de Biran; the chief interest of his work, however, lying in the extent to which he afterwards broke away from their lead. Him M. Picavet leaves here aside (except in the way of frequent incidental reference), but only to reserve him for special study in connexion with a newly recovered Institute-memoir from the days of his Ideological enthusiasm.

A few pages of "Conclusion" (571-83, followed by some *inedita* as appendix) are the less to be overlooked, because here M. Picavet does what he can, in other way than by the much-missed index, to bring together the multiplex threads of his whole inquiry. In the last paragraphs of all, there is a striking imagination of the state of mind of an Ideologist transported from the beginning of the century, when he worked so confidently for human enlightenment and progress, to the century's end with its vast increase of scientific knowledge but also increasing sense of the limits set to positive science and its ever-growing burden of social difficulties and perils. The Ideologist, it is allowed, would have to abate much of his practical optimism, and could no longer deal so lightly as he did with philosophical questionings because they had failed of decision. None the less he might truly claim to have done a real stroke of work in his day. He had broken ground in every one of the lines upon which psychology has since advanced,—an effort only partially recognised in the foregoing notice but admirably shown in the book itself. He had also had his own measure of philosophic insight when he proclaimed that all other human search and all human striving should own the sway of a science of "Ideas".

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